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Textile World

September, 1934

Editor: DOUGLAS G. WOOLF

1884—1934

. . . and What About 1984?

LAST year the United States consumed three times as much synthetic fiber as it did silk, the material which Count deChardonnet was trying to reproduce synthetically.

That one fact, we feel, tells most dramatically the story of the first half-century of rayon.

What will editorial writers say on its centennial anniversary in 1984?

Even though he is an optimist, this editorial writer does not expect to be saying much at that time. Consequently, he will anticipate it now.

Ever since the beginning of the major synthetic-fiber impetus in 1920, there have been constantly recurring predictions that the end was in sight. The "bubble" would burst soon, was the warning. When annual world production passed the 100,000,000 lb. mark 10 years ago, it was apparent to many a wise guy that this sort of thing just couldn't go on.

And yet, 1934 production in this country alone will approximate 200,000,000 lb., and the world output will be over 700,000,000 lb.

Is the end in sight now? We do not believe so.

Having been consistently bullish on rayon during the last 15 years, and having had plenty of opportunity to say "I told you so," we see no reason to change our position on this material now.

At the risk of ridicule, we have ventured the statement, in these columns and elsewhere, that synthetic fibers might possibly replace natural fibers to a very large degree over the course of time. We find it necessary to repeat this observation periodically because, no matter how remote that possibility may be, it challenges, or should challenge, the thought of everyone connected with the textile industry.

We find our pet analogy in the field of dyes. In the early days of synthetic coloring matters, a prediction that eventually they might supplant natural dyes would have been laughed down. But that is exactly what has happened. The factor of controllability, inherent in man-made products but not in the produce of nature, is the reason therefor.

It is this factor that has been responsible for the growth of synthetic fibers. In its wake come uniformity, adaptability, regulation of supply, and similar assets which take guesswork out of the raw-material element in manufacturing.

Against this powerful argument, skeptics point out characteristics of natural fibers which, to date, have not been reproduced in synthetics. Granted. But, in answer, we must repeat that there is no apparent limit to the possibilities which may develop from the collaboration of chemists and engineers providing the financial incentive exists—and it certainly does exist in this field. To point to any of today's rayons as the ultimate in human achievement is as silly as it would have been to so describe the materials from which our pre-war "artificial silk" neckties were made.

Incidentally, it was these same skeptics who not so many years ago asserted smugly that rayon was all right as a decorative material, but not as a self-fiber. What have they got to say about that today?

And so, we believe there is a chance that the editorial writers of 1984 may discuss synthetic fibers as the then major supply of textile raw material. If so, we can anticipate a few changes between now and then.

This doesn't mean the death-knell of the textile industry as we know it today. The rayon growth of the last 15 years hasn't meant any such thing. The progressive silk manufacturer is still in business but he is a rayon and silk manufacturer, with the emphasis on the rayon.

The man who will get hurt is the one who joins Ed Wynn in saying, "I'll stick to my horse."

The only difference is that Ed Wynn is just fooling.

Rayon Packages

Synthetic-fiber yarns are now furnished by their makers in such forms as skeins, regular cones, oiled cones, pigtail cones, bottle bobbins, spools, double-head bobbins, parallel tubes, and, to some extent, cops. Still other packages may soon be available. Packaging policies bear an important relationship to the future dividing line between rayon makers and users. The trend and its probable effect are discussed in an article on pages 76 and 77

◆

Rayon Output

1884 1934

Ordinarily, we would prefer not to start a special section with a statistical article. But rayon statistics are different. They are never deadly. They tell of life and growth. . . . So here is this year's thriller—a fitting introduction to this Golden Anniversary section.

In World This Year Seems On Way to Another Record

FROM where we sit, it looks like another world's record in synthetic-fiber output this year: a fitting way to celebrate the 50th anniversary of its start in life. Putting together our own estimate for United States production and the estimates for other countries supplied by our Manchester (Eng.) correspondent, we get an apparent 1934 total of 744,000,000 lb., comparing with 660,000,000 in 1933—an increase of 13%.

Our chief regret—and we mean just that, because we take a personal interest in these statistics—is that the domestic production apparently will not quite come up to last year's record of 208,000,000 lb. We estimate a probable output of 195,000,000 lb. in the United States in 1934. (Not so bad, however; only 6% below 1933.) As a check against this, available data seem to indicate that consumption of synthetic fibers this year should be about 187,000,000.

But here's where we must inject a word of caution. We have been talking rather confidently up to this point. However, honesty forces us to call our customer's attention to the use of the word *estimate*. The above predictions have been manufactured partly out of fact, supplied us in confidence by the majority of manufacturers, and partly out of theory, particularly in so far as the outlook for the rest of the year is concerned. Obviously, no one can be positive on this score. We believe our estimates should prove to be fairly accurate; they have in the past. But they are offered without guarantee. As a further complication, comes the textile strike. Our calculations were completed prior to its initiation. Naturally, the extent of probable consumption of all textile fibers for the balance of the year is obscured by the question of the extent and duration of labor troubles.

Incidentally, we were surprised at our own total for United States production this year. We had expected it to be lower.

The figures on other countries supplied by our Manchester correspondent indicate an extraordinary gain in Japan over last year, and substantial increases in other countries including Italy, Germany and France. But our correspondent warns: "The final figure may be very different from that shown at this stage." Here are his estimates, and ours for this country (both in pounds):

	1934	1933
United States	195,000,000	208,000,000
Japan	133,000,000	89,165,000
Italy	91,500,000	80,990,000
Germany	87,500,000	76,000,000
Great Britain	86,610,000	84,300,000
France	72,500,000	53,000,000
Holland	25,100,000	22,000,000
Switzerland	10,000,000	12,000,000
Canada	9,520,000	7,820,000
Belgium	8,600,000	8,925,000
Others	24,670,000	18,355,000
Total	744,000,000	660,555,000

Synthetic Fiber Production, 1920-1934

	United States	World
1920	9,000,000	50,000,000
1921	18,000,000	65,000,000
1922	26,000,000	80,000,000
1923	35,000,000	97,000,000
1924	38,750,000	141,000,000
1925	52,200,000	185,000,000
1926	62,575,000	219,000,000
1927	75,050,000	267,000,000
1928	97,700,000	345,000,000
1929	123,000,000	404,000,000
1930	119,000,000	417,000,000
1931	144,350,000	470,000,000
1932	131,000,000*	509,000,000
1933	208,000,000	660,000,000
1934	195,000,000**	744,000,000**

*From the Textile Organon; all other figures are TEXTILE WORLD's.
**Preliminary estimates.

Rayon's Present and Future Place in the

Battle of the Fibers

By Stanley B. Hunt

1884.....1934

During 35 years of its first half-century, "artificial silk" was not a serious contender in the "Battle of the Fibers." Today rayon is very much in the fight. Here is the latest news from the front.

THE future place of rayon in the battle of the textile fibers for the consumer's dollar hinges around the control items of style and price. If the rayon industry is to go ahead in the next decade as it has in the last decade, these factors must be "right." Although the discussion in this article will be divided into an examination of each of the factors separately, it is clear that in many respects the two factors are interdependent and therefore must be considered simultaneously. Unless otherwise noted, this article deals with the long-term point of view of the rayon market.

The Style Factors Involved

The word style here must not be interpreted narrowly in the sense of mode or fashion, although these factors are of importance. Style also must include fiber adaptability. Thus rayon is not used in men's woven shirtings, for example; the reason here does not seem to be either price or style in the sense of fashion, but rather style in the sense of adaptability. On the other hand, all the fibers are adaptable to one degree or another in the manufacture of underwear.

A second style factor in the case of rayon is its substitutive character. Rayon's position is at the center of a triangle, the three corners of which are silk, wool, and cotton. Other factors being equal, rayon has wide adaptability as a substitute for the other fibers. Its position at the focal point of this style triangle, therefore, has many advantages as well as a few disadvantages. Thus, because it is a versatile fiber, rayon has tended to unite the textile field, allowing not only combinations of fibers to be woven together, but also allowing a switch from one fiber to rayon and vice versa. On the other hand, this very fact has proven a sore spot in such matters as the jurisdiction of various Code Authorities in the textile field.

A third rayon style factor has to do with the new character of the rayon fiber and the exclusive effects obtainable with it. For a number of years rayon was called "artificial silk," implying that its main excuse for existence was to substitute for real silk. During the last decade this narrow market concept of the use of rayon definitely has been disproved; for if the entire future of the rayon industry depended only upon its ability to eliminate the 70,000,000 lb. of natural silk consumed annually in this country, the outlook for rayon would be dark indeed.

Rayon has created innumerable new markets for itself during the last decade based on characteristics which are exclusive to rayon alone. To be noted in this connection are the different effects obtainable by each of the four processes of rayon manufacture and the possibilities of denier control, filament size, and luster, for example. Combinations of these factors, exclusive to rayon alone as the man-made fiber, have opened up entirely new textile fields which the natural fibers could not possibly develop.

Granted the adaptability factor, then, the growth of rayon consumption in the country has been predicated not only on substitution, but also on the creation of new and exclusive effects in textiles.

Price Considerations

Previous studies* have shown that the price trends of the textile fibers are inversely proportional to their consumption trends. Thus we find over the last 15 years that the price of wool has declined the least of any of the textile fibers, followed by the prices of cotton, silk, and rayon, the latter price having declined at the greatest rate over the period. The corresponding rates in growth in consumption have been in the same order: Wool consumption shows an actual declining trend, cotton consumption is increasing slightly, followed by silk and then rayon, the consumption of which has grown at the highest rate of all. These facts would indicate that up to the present time the adaptability of rayon, both in the sense of substitution and of new uses, has not been a great problem, while price has been a very important factor.

Now the price, supply and demand of any commodity are mutually interdependent. Without discussing the matter in detail here, it appears that the chief or determining factor of these three for each textile fiber is as follows: cotton—supply, wool—demand, silk—demand, and rayon—price. In cotton, the size of the crop from year to year is the greatest variable; in wool, the supply changes much more gradually while demand fluctuates rather erratically; again in silk, the supply changes slowly while demand may be quite irregular. But in rayon, even though the supply is quite controllable on an individual company basis, the price has essentially been set only slightly above the manufacturing cost while supply and demand have "taken care of themselves" generally speaking. In this way, then, the chief factor in rayon's price-supply-demand equation appears to be price, which in turn represents a production cost that has been constantly lowered. All of these observations refer to long-term trends, of course.

Further light on the place of rayon in the textile

*Textile World—Sept. 26, 1931, p. 90 (1176).

price structure is given by the studies of Winnifred Jacobs of the International Statistical Bureau. Her findings indicate that if the relationships of fiber prices pre-rayon (before 1926) were correlated and then extended to 1934, then (a) the projected price of cotton and wool today would be essentially the same as it actually is and (b) the price of silk would be $4.00 per lb. instead of the present $1.20. From these observations it appears that cotton and wool prices have essentially ignored rayon prices, while silk prices have been very sensitive to rayon prices.

Now while the preponderant size of cotton consumption relative to rayon consumption (15 to 1 poundage-wise) and the "non-competitive" aspects of wool and rayon are factors here, a more important point apparently is that rayon is essentially a silky fiber. This holds true in its substitutive uses as well as in its exclusive uses. The extent to which rayon may have "substituted" for cotton in knitting items particularly has been determined on the basis of rayon's silky appearance and not on any particular price factors so long as these were only reasonably higher than the corresponding prices of cotton items. Thus, not only because of the price factors brought out by the Jacobs study, but also because of its appearance, rayon may be considered a silky type fiber.

Competition for the Consumer's Dollar

The accompanying chart depicts data on the percentage of the consumer's dollar which went for each of the four textile fibers annually from 1920 to 1934. While realizing the limitations of these data (*raw* cotton is compared with rayon *yarn,* for example), it provides a useful measure of the proportion of the consumer's dollar taken by the various textile fibers.

It will be noted that for the period 1920 to 1932, the percentage of the consumer's dollar taken by cotton declined and the percentage taken by rayon increased, while the percentage taken by silk and by wool essentially remained constant. From 1932 to 1934 the percentage, taken by cotton nearly doubled, wool continued to remain fairly constant, rayon declined somewhat, silk declined to one-half its 1932 importance.

Among other things these data would seem to indicate that the percentage of consumer expenditure for the silky fibers did not begin to decline until three years after the depression started and further that these fibers have not as yet recovered from the effects of the depression. If it could be assumed that, because there was a three-year lag between the beginning of the depression (1929) and the peak of the relative value of the silky fibers (1932), there would be a corresponding three-year lag between the low of the depression (1932) and the upturn of the silky fibers curve, then the silky fibers curve would reach an indicated bottom in 1935. Considering the large industrial uses of cotton, the governmental price-upping plans for cotton, and the extreme price competition between rayon and a desperate silk it would not be surprising if the low for the silky fibers curve does come in 1935 as indicated. It should be carefully noted that these statements refer to *relative values,* and not to the actual values or the poundages of the fiber consumption involved.

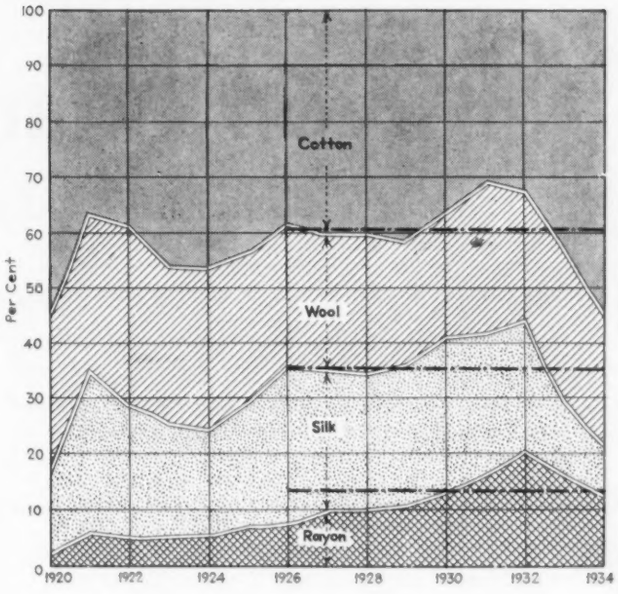
Some Indicated Future Trends

It is believed that rayon consumption will increase over the next few years at essentially the same rate as has obtained in the past decade. But it further appears that this consumption curve will grow more or less rapidly than the past rate, depending on whether or not technical rayon production and weaving developments allow the fiber to get out of its "silky type" fiber classification and expand into "cotton type" and "wool type" rayons. Stated another way, if a "cotton type" or a "wool type" rayon can be developed commercially so as to augment the present "silky type" rayon, the field of growth for rayon consumption would be greatly enlarged. Research in rayon production along the lines of stretch, slippage, tensile strength, and elasticity would be indicated here.

The price trend of rayon relative to the general price level is still downward over the long term, thus being favorable to an increasing poundage consumption trend. Technological improvements in manufacturing are believed to be more than sufficient to offset increased wage rates and raw material costs. This statement does not refer necessarily to the present price of rayon, but rather to the longer period under consideration in this article.

Rayon is expected to become of increasing importance as a uniting force in the textile industry, standing as it does at the focal point of the cotton-wool-silk triangle both in the style and the price sense. While this unique position of rayon has many advantages to fabricators of textile goods, it gives rise to a number of disadvantages not only of a jurisdictional type for code control purposes, but also of a political, vested-interest, sectional-interest nature. These latter problems may well be watched closely by the entire industry as, or before, they may develop.

Relative Value of Fiber Consumption



These data are calculated by multiplying the average annual price of each fiber by its annual consumption, totalling these values for the fiber, calling this total 100% for each year, and calculating the percentage which each fiber's value bears to the total value for the year. The *actual dollar value* of all four series above (stated in billions of dollars) varied from 1.7 in 1920, down to 1.0 in 1921, up to 2.0 in 1933, down to a steady figure of about 1.6 for the six years from 1924 to 1929, then down progressively to a low of 0.5 in 1932, and up to 0.8 in 1933 and 0.9 (est.) in 1934. The cotton data includes the processing tax of 1933-34. The 1933 figures are as follows: cotton 0.32, wool 0.22, silk 0.10, and rayon 0.13 total 0.77. Prices used as follows: raw spot cotton, clean raw wool, gum silk, and rayon yarn. Consumption and price data are shown in the *Textile Organon,* February and March 1934, pp. 26 and 39. The light horizontal dash-dots lines from 1926 to 1934 are the individual fiber averages for that nine year period.

Year's Technical Developments in

Rayon Manufacture

By Harold DeWitt Smith, Ch.E., Ph.D., F. T. I.

1884 1934

Before Count de Chardonnet died in 1924, he saw amazing changes in the technique of the industry he had created. During the decade since his death, new chapters have been written. This is the latest instalment.

PERHAPS all of the larger producers of rayon have been so fully occupied with the construction of new units that details concerning the equipment installed and the products which it will produce will first be available as interesting news during the coming year. Perhaps, on the other hand, the industry now is reaping a scanty harvest of new developments because of the rather ruthless way in which research staffs were cut in some quarters a few years ago. Whatever the cause, there are no outstanding or startling events to record in this review of technical developments of the last year in the manufacturing methods and properties of the synthetic yarns. There are, however, trends to be discerned and some straws to show which way the wind is blowing.

Announcement was made shortly before this was written that what to the best of the writer's knowledge was the last surviving unit operating the nitrocellulose process has apparently decided to abandon this process indefinitely. Therefore, until some of the newer compounds of cellulose on which a vast amount of experimental work is being done shall reach commercial success, it leaves the field to the three healthy survivors: viscose, acetate, and cuprammonium.

The search for ways to shorten and simplify the viscose manufacturing process continues. From Europe comes a report of equipment designed to substitute a continuous sheet of alpha cellulose for the present standard square sheets and to feed this continuously through the alkali bath and the ripening chamber before shredding and dissolving. The British have a machine that combines the xanthating and mixing stages, which are said to be completed in 4½ hr. instead of the usual 8 hr. Use of centrifugal clarification to replace some of the filtering is gaining rapidly in this country. One machine can handle from 1000 to 1500 lb. per hour; and, in addition to the saving in power, labor, and filter materials, the centrifugal treatment is said to improve the dispersion of oil or pigment delustrants in dull-yarn manufacture.

Efforts to increase the speed of spinning viscose yarn continue. Speeds of 100 meters per minute are again reported in experimental plants; but the practical limit on existing commercial equipment seems to be about 70 meters; and for best quality of product, still lower speeds are desirable. There is some evidence, however, that the reduction of the CS_2 content can yield a viscose solution which will spin better at high speeds than at lower speeds.

The Germans have developed a pot in which the yarn as it is spun is washed by a spray attached to the traversing guide. Another high-speed spinning pot is sprayed with warm water on the outside and with wet steam inside to prevent the formation of salt crystals from the evaporation of the spinning bath.

In aftertreatment, suction washing is said to be more prevalent than pressure washing. A great variety of equipment is described in the literature for aftertreating cakes from pot spinning and also bobbins. A combination of spraying and dipping is used with special winds to make the package as porous as possible and means for permitting maximum shrinkage during the aftertreatment. Because of the restriction of shrinkage in a wound package, as well as the difficulty of efficient penetration by liquids, the method of winding skeins and aftertreating in skein form seems still to be necessary for the best quality yarns.

One of the smaller viscose producers has introduced a multifilament yarn with flat filaments. Flat-filament yarn is said to have a greater covering power and to be at least as soft as the equivalent round-filament yarn. During the year a number of the viscose manufacturers have brought out fine-filament yarns (approximately 1 denier per filament). Another development is the offering of viscose yarns on cones prepared for throwing.

Apart from a vast amount of patent literature, there has been little published information on progress in acetate yarns. An acetate producer in England has brought out a "Blanche" yarn with a luster which is described as "of fine subdued silky opalescence," rather than chalky, as has been the mode. In this country the same company announced a 150-denier, 60-filament structure to take the place of its 40-filament structure; other acetate manufacturers have been producing a structure between these two. It also has offered recently a black yarn in both bright and dull luster, which is the first commercial example of the spinning of colored yarns. During the year all methods of producing a dull acetate yarn except by the use of pigments were apparently abandoned.

Turning to the cuprammonium process, we find that the Furness continuous processing apparatus has not yet made the strides expected of it when it appeared 2 yr. ago. It is interesting to note, however, that a number of attempts have been made to imitate it by means of similar devices. It has also been suggested that the machine might be used in viscose manufacture.

Finally, in the spun-rayon field, we note plenty of activity and some novel ideas. One development is the production of short filaments at the spinneret by using a piston pump which extrudes the spinning solution intermittently. The resulting fiber is said to be crinkly and wool-like in appearance. An improvement on the present method of cutting the staple after the skeins have been aftertreated consists of cutting the staple in the acid state and then aftertreating the cut fibers. The result is a better mixing of the fibers and more crimp.

A Sheer Rise

Predicted, Tentatively, for Next Spring

By Carl C. Mattmann, Jr.

1884 1934

What with novelty sheers, and fine sheers, and cross-check sheers, and heavy sheers, and ribbed warp sheers, and other sheers, life is complex for the designer of today. But that's one of the penalties of a half-century of growth.

WHEN one attempts at this writing to gaze ahead through the swirling mists of winter storms at the sunny, although doubtlessly somewhat rocky, shore of spring, one sees a strange mixture of things. Fabric styles are only beginning to take shape. Many old friends among the constructions of recent months seem to be fighting bravely to hold their ground; and, more surprising than anything else, the matelassé is coming into view again. Most clearly seen of all, however, are the sheers, which promise to increase their importance over recent seasons. These sheers are likely to be of many types, including such distinctive novelties as small matelassé effects and ribs.

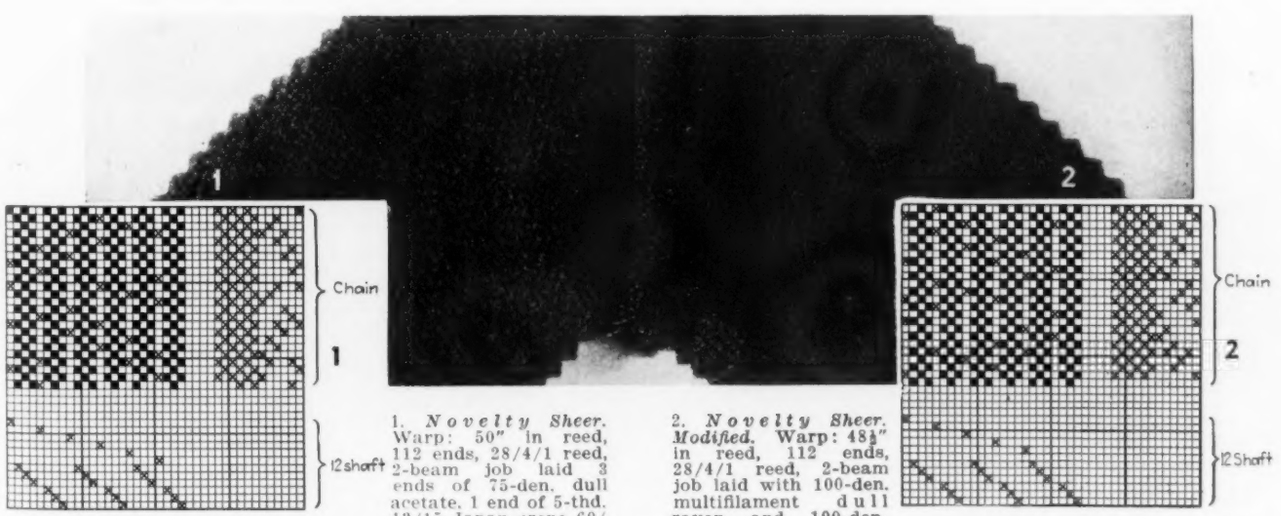
A layman might expect that sheers, being delicate fabrics in the first place, would not be subjected to the usual cheapening processes to which most fabrics are exposed after the manufacturing season is under way; but sheer constructions can be changed or modified about as easily as any other—and often without serious injury to the fabric and its vogue. Fortunately, however, many of the changes made in the early constructions of a sheer season are intended to, and actually do, improve upon the originals. I shall give one or two examples of such modifications based on the experience of a past season.

I recall an attractive novelty sheer which was originally of a very high-grade construction. A sample of this material is shown as No. 1 of the accompanying illustrations, and the details of construction are given in the small type which accompanies the photograph. In the cheapening process the following changes were made: For the 75-denier acetate in the warp was substituted 100-denier low-luster multifilament rayon; and 100-denier multifilament rayon crepe was used in place of the silk crepe. The pickage was reduced from 80 to 56, the acetate and the silk crepe in the filling being replaced by 200-denier dull rayon normal twist and 150-denier rayon crepe right and left twist. The resulting fabric, No. 2, was similar to the first in appearance and proved acceptable in its price bracket, but it lacked the fineness and appreciation of weave of the original.

For an actual example of changes made in an original construction with a view to its improvement, consider the case of the following medium-weight dress fabric (the same principles can apply to sheers): warp, 100-denier multifilament rayon, 47½ in. in reed, 135 ends; filling, 64 picks of 100-denier rayon crepe, two right and two left; weave, ten-shaft dobby as shown. See sample and construction No. 3. (This, and others on pages 70, 71)

In the revision, No. 4, an acetate warp was used and 2½ in. was added to the width in the reed. The filling was changed to 60 picks of the following: two picks of 29/2 spun-rayon crepe right twist, four picks of 100-denier rayon crepe two right and two left. In other words, although the original theme of the ten-shaft weave was preserved, the two heavy picks inserted between the small dobby effects served to emphasize the latter and to produce an appearance similar to a matelassé. The final effect could be cheapened without total sacrifice of appearance by substituting 300-denier rayon crepe for the 29/2 spun-rayon crepe. It might be imitated still more cheaply by simply weaving 100-denier rayon crepe six right and two left.

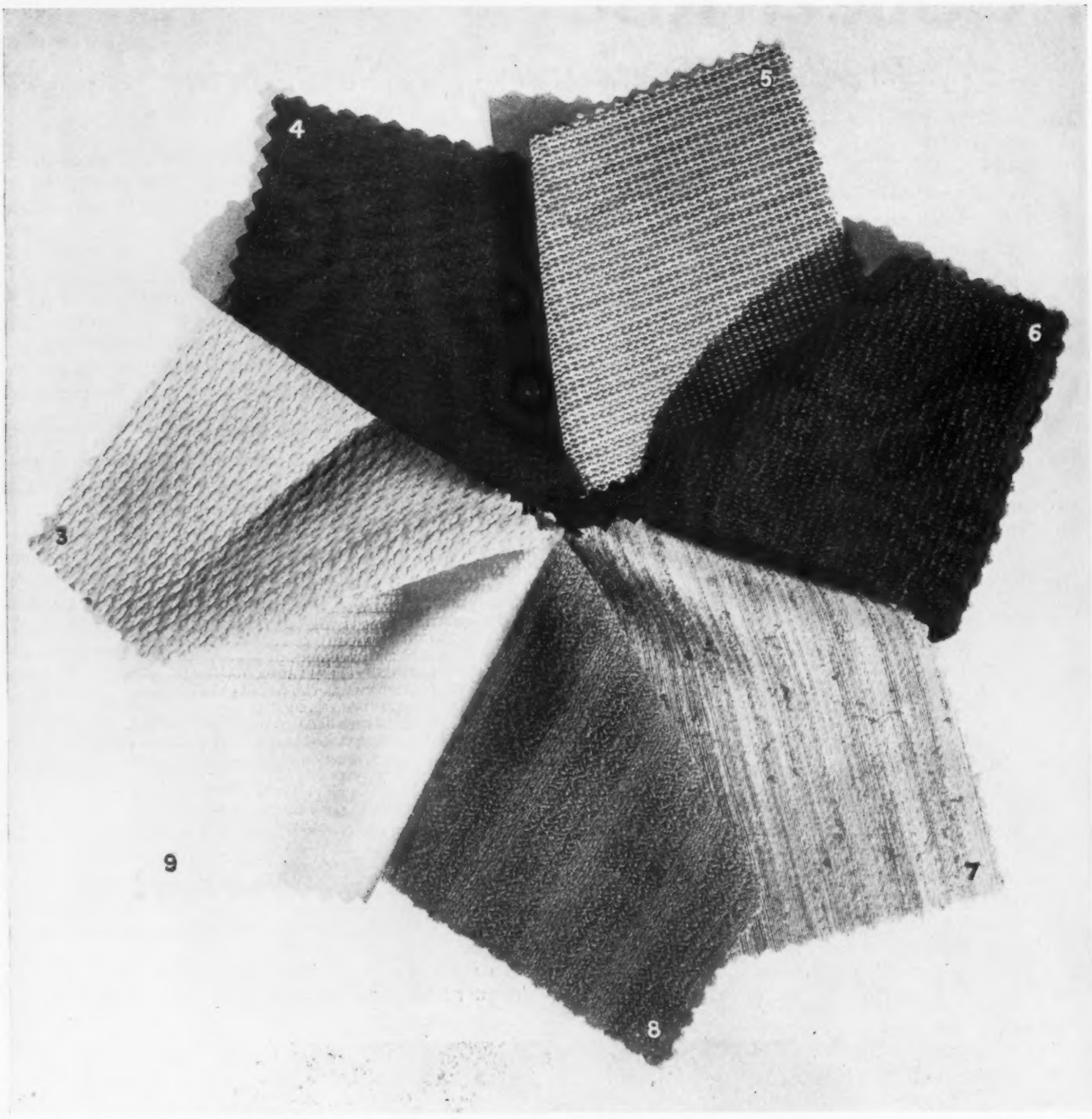
In such fabrics much depends on the finish, and the designer must work conscientiously with the finisher.



1. *Novelty Sheer.* Warp: 50" in reed, 112 ends, 28/4/1 reed, 2-beam job laid 3 ends of 75-den. dull acetate, 1 end of 5-thd. 13/15 Japan crepe 60/65 turns r.t., 3 ends of same acetate, 1 end of same crepe r.t., 3 of acetate, 1 of crepe l.t., 3 of acetate, 1 of crepe l.t. Filling: 80 picks shot 2 picks of 200-den. dull acetate, 2 picks of 5-thd. 13/15 Japan crepe 60/65 turns r.t., 2 picks of same acetate, 2 picks of same crepe l.t. Woven on 4x1 loom. Finished width: 38½ to 39".

2. *Novelty Sheer. Modified.* Warp: 48½" in reed, 112 ends, 28/4/1 reed, 2-beam job laid with 100-den. multifilament dull rayon and 100-den. rayon crepe 50/55 turns in same order as in preceding construction (No. 1). Filling: 60 picks of 200-den. multifilament dull rayon and 150-den. rayon crepe 45/50 turns shot in same order as in preceeding construction. Weave: Slightly different from No. 1, as shown above. Finished width: 38½ to 39".

Spring Fabrics Feature Sheers—



3. **Medium-Weight Dress Fabric in Dobby Pattern.** Warp: 47½" in reed, 135 ends, 45/3/1 reed, 100-den. multifilament dull rayon. Filling: 64 picks of 100-den. rayon crepe 50/55 turns, 2r. 2l. Weave: Shown below, woven on 2x1 loom. Finished width: 38½ to 39".

4. **Dobby Pattern Given Matelassé Effect.** Warp: 50" in reed, 135 ends, 45/3/1 reed, 100-den. dull acetate. Filling: 60 picks shot 2 picks of 29/2 spun rayon r. t. only and 4 picks of 100-den. rayon crepe 2r. 2l. Weave: On 4x1 loom, but same as No. 3. Finished width: 38½ to 39".

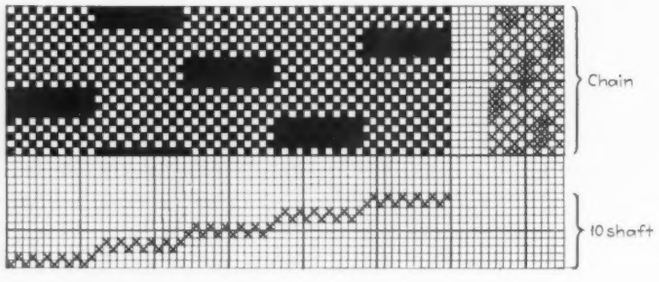
5. **End-and-End-Warp Cross Dye:** 49" in reed, 168 ends, 42/4/1 reed, 2-beam job laid 1 end of 100-den. dull acetate and 1 end of 100-den. bright rayon. Filling: 48 picks of 200-den. rayon crepe 2r. 2l. Weave: 8-shaft on 2x1 loom.

6. **Fancy Armure.** Warp: 49" in reed, 135 ends, 45/3/1 reed, 100-den. multifilament dull rayon. Filling: 50 picks of 300-den. rayon crepe 2r. 2l. Weave: 14-shaft on 2x1 loom.

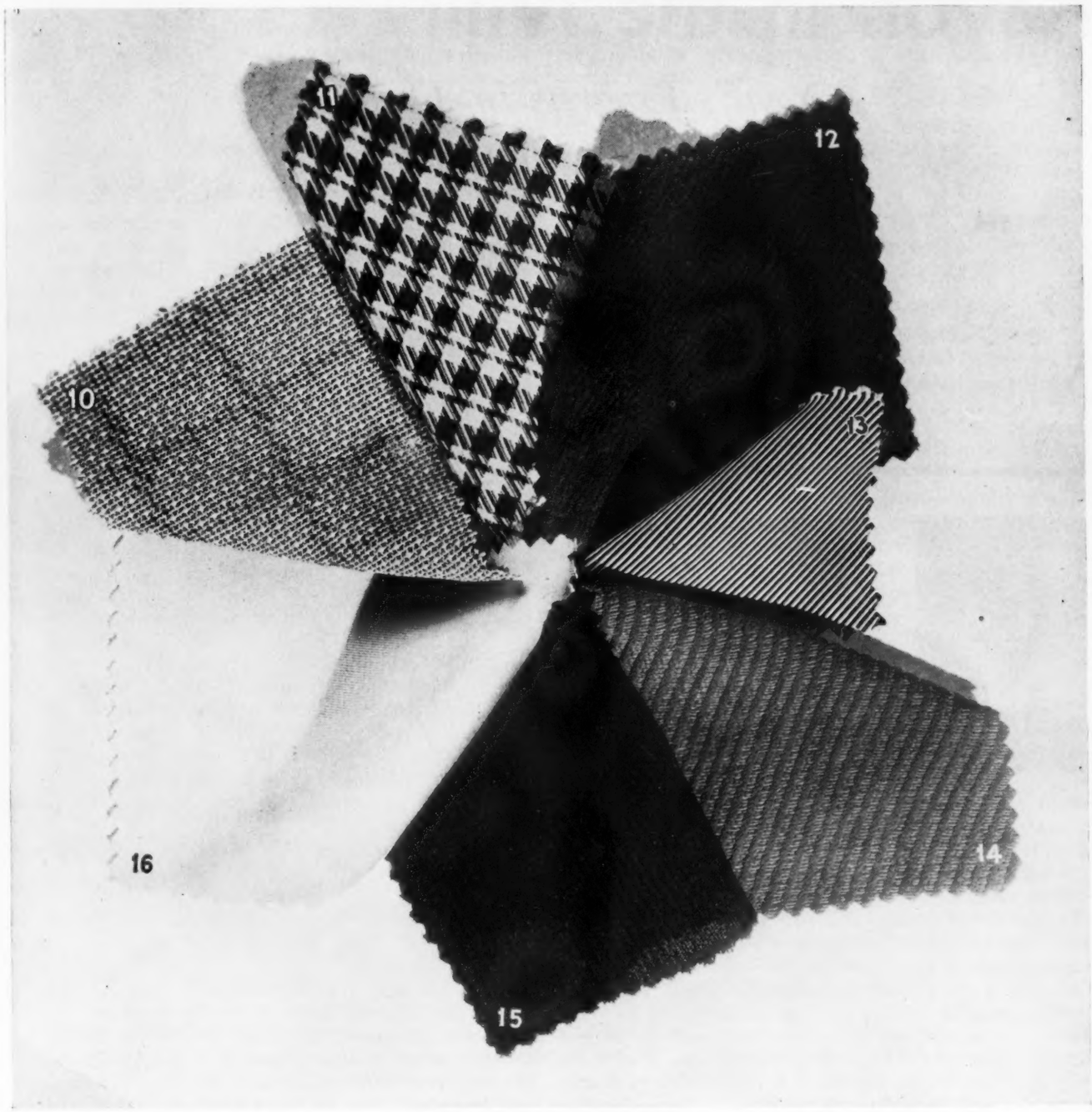
7. **Hairy Sport Cloth.** Warp: 42" in reed, 150 ends, 50/3/1 reed, 75-den. bright rayon. Filling: 52 picks of hairy 20/1 rayon and spun-silk yarn, stock-dye blend. Weave: 4-shaft on plain loom.

8. **Sport Wear.** Warp: 52" in reed, 64 ends, 32/2/1 reed, ondé or moss-crepe yarn consisting of 100-den. acetate twisted with 100-den. rayon crepe, 2r. 2l. Filling: 48 picks of same yarn as warp 2r. 2l. Weave: 4-shaft on 2x1 loom.

Weave for Sample No. 3



—Spring Fabrics Feature Sheers



9. **Fine Sheer.** Warp 47½" in reed, 120 ends, 40/3/1 reed, 75-den. cuprammonium 28-turn voile twist. Filling: 88 picks of 75-den. cuprammonium crepe 2r. 2l. Weave: 8-shaft on 2x1 loom.

10. **Cross-Check Sheer.** Warp: 50" in reed, 120 ends, 2-beam job laid 4 ends of 100-den. dull acetate and 2 ends of 100-den. rayon crepe, the latter yarn alternating 2r. and 2l. Filling: 60 picks shot 2 picks of 200-den. dull acetate and 2 picks of 100-den. rayon crepe, the latter yarn alternating 2r. and 2l. Weave: 12-shaft on 4x1 loom. Cross dye.

11. **Surah Check.** Warp: 41" in reed, 120 ends, 40/3/1 reed, 2-beam job laid 20 ends of 100-den. rayon, 8 ends of 100-den. dull acetate, 5 ends of 100-den. rayon, 15 ends of 100-den. dull acetate. Filling: 76 picks shot 18 picks of 150-den, rayon and 18 picks of 150-den. dull acetate. Weave: 12-shaft 5 up, 1 down, 1 up, 5 down, woven on 2x1 loom.

12. **Heavy Sheer.** Warp: 50" in reed, 160 ends, 32/5/1 reed, 2-beam job laid 4 ends of 75-den. dull acetate and 1 end of 100-den. rayon crepe, the latter left twist only. Filling: 44 picks of 24/1 spun-rayon crepe, 2r. 2l. Weave: 12-shaft on 2x1 loom.

13. **Straight Surah.** Warp: 41" in reed, 160 ends, 40/4/1 reed, 75-den. dull acetate. Filling: 120 picks of 100-den. bright rayon. Weave: 12-shaft 6/6 on plain loom. Cross dye.

14. **Diagonal Sheer, Cross Dyed.** Warp: 47" in reed, 135 ends, 27/5/1 reed, 2-beam job laid 4 ends of 100-den. dull acetate and 1 end of 100-den. rayon crepe, the latter right twist only. Filling: 72 picks of 3-thd. 20/22 Japan crepe 60/65 turns, 2r. 2l. Weave: 12-shaft on 2x1 loom.

15. **Ribbed Warp Sheer.** Warp: 49" in reed, 112 ends, 28/4/1 reed, 2-beam job laid 3 ends of 75-den. dull. acetate and 1 end of 5-thd. 13/15 Japan crepe 60/65 turns, the latter in the order of 2r. 2l. Filling: 92 picks shot 2 picks of 100-den. dull acetate and 1 pick of 5-thd. 13/15 Japan crepe, the latter in the order of 2r. and 2l. Weave: 6-shaft on 4x4 loom.

16. **Heavy, Stiff Alpaca Effect.** Warp: 40" in reed, 200 ends, 40/5/1 reed, 2-beam job laid 4 ends of 100-den. dull acetate and 1 end of 100-den. bright acetate. Filling: 100 picks of 120-den. dull acetate. Weave: 8-shaft on plain loom.

Rayon in the Mill

A Year's Progress in Throwing, Weaving, Knitting, and Finishing

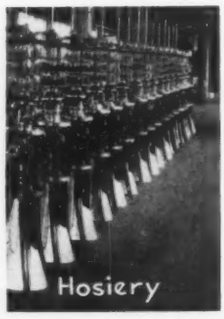
1884.....1934
ONE YEAR'S progress in fabricating rayon is an impressive thing, and progress is going to move on at an inspiring rate for many years to come. This article would have been fiction to textile men of 1884; to us it marks progressive accomplishment; it will be an antiquity to technicians of 1984.

Throwing

WITH THE final acceptance of rayon as a direct competitor of silk in many of the fabrics previously confined to silk alone, many throwsters found that their equipment and ideas of quality were wholly inadequate. However, they soon recognized that cleanliness is a prime necessity, and there has been a slow but gradual adoption of the oilless principle, not only on twisters, but on every machine used in the conversion of rayon yarns into crepe. Stretching of rayon during winding has always been avoided by good throwsters, but it is only lately that faulty redrawing has been generally accepted as a serious offender in this connection. The result is complete oblivion for the stationary creel pin and disrepute for the fixed gudgeon, with final recognition of the loose pin as the only practical method of eliminating friction which varies as the unrolling spools are depleted and replenished.

Ever since the dyeing of silks and rayons in the piece became important, attempts have been made to achieve specific cloth effects by varying the percentage of soaking material used by the throwster. That these attempts were doomed to failure was obvious to those familiar with the methods used by dyers and finishers to control creping. The surprisingly irregular effects noted by many of the proponents of "controlled soaking" on their heavier rayon crepes of last season served as a reminder that uniformity of take-up during the twisting of a specific lot is still the good throwster's greatest asset, and that control of this take-up for specific cloth effects should be his main objective in throwing rayon crepes.

While there have been no outstanding changes in the technique of rayon throwing during the last twelve months, the future holds promise of many developments in the methods and processes now being used for the production of rayon crepe yarns. Rayon producers have made considerable advances in the production of oiled and tinted cones for throwing purposes, and the next year or two will see further improvements in this product with corresponding increase in its use. Rayon lends itself more readily to the use of large packages than any of the natural fibers; and, while it is problematical whether cones will be the means of displacing skeins, they are at least a step in the right direction. The next move is the adaptation of throwing equipment to the handling of large packages in such a manner that quality is not sacrificed for economy.


Hosiery

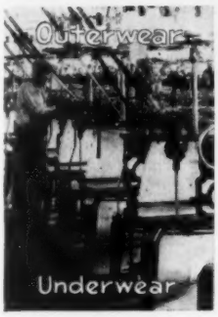
RAYON CONTINUES to be used largely in women's seamless hosiery, as well as for decorative and cross-dyed effects in men's seamless hosiery. Recently, however, it has been used with some success in women's full-fashioned hosiery, and additional experimental and development work is now under way in this direction.

In the hosiery industry the distribution between extra-dull and semi-dull yarn is about even. There is still a demand for bright yarn, particularly in half hose and anklets. One large producer, however, anticipates a reaction against extra-dull yarns in hosiery and has developed a special knitting yarn with a luster in between the semi-dull and extra-dull. This line of yarns has not been on the market long enough to determine to what extent it will be accepted by the trade.

The regenerated cellulose yarns are still used with cotton in hosiery; and, since they possess dyeing properties similar to cotton, permit of union dyeing. These yarns are also largely used in combination with acetate, silk, and wool, being cross-dyed for the production of special color effects.

There has been a definite trend in rayon production toward finer-filament yarns. While the fine-filament yarns have been in demand principally for woven goods, they possess certain qualities desirable in knit goods. A fine-filament yarn used as a plating thread possesses more covering power than a coarser-filament yarn of the same denier. The greater softness of the fine-filament thread also adds pliability, which contributes to ease in forming the knitted stitch. These advantages are offset somewhat by the fragility of the fine filament, which breaks more easily under the strain of knitting. Damage from abrasion through contact with needles and sinkers is also more likely to occur in processing fine-filament yarns. One producer of viscose yarn reports a tendency toward the use of 100-denier and 125-denier yarns. This demand has doubtless been brought about by the use of machines of slightly finer gage. The 150-denier yarn still predominates however.

More attention has been paid to packaging the yarn for the knitter. Use of emulsifiable-oil treatments has simplified the problems of the hosiery finisher, as well as the knitter. Some hosiery knitters still prefer the 2-lb. cone, but there has been a tendency toward the larger package, containing about 3-lb. of yarn.



FOR MANY YEARS the knitted-rayon industry confined itself to the manufacture of plain or jersey and run-resist underwear fabrics. It was only when business dropped off and everyone from the machine builders down started to look for ways and means to bolster up shrinking sales that things started to happen to knitted rayons. Plain and run-resist underwear fabrics have been replaced to a large extent by novelty fabrics involving the use of high- and low-luster yarns in combination with tuck-stitch constructions. An outstanding example of this group is known as Sparkle-Ray. Its attractiveness is accentuated by its simplicity. With plain jersey stitch in dull yarn for a background, a uniformly spaced tuck in high-luster yarn gives a pleasing effect.

The popularity of rayon and Lastex knitted girdles has been enhanced by the improvement of mechanism to fashion the garment according to the feminine contour. By automatically controlling and varying the speed of delivery of the Lastex, one can knit it into the fabric under varying degrees of tension, thereby shaping the garment according to the amount of tension applied.

A marked improvement in the knitting quality of acetate yarns, advances in the technic of cross-dyeing and finishing and development of many new and attractive stitch and pattern effects have contributed to the popularity of acetate and viscose-acetate fabrics for dresses, bathing suits, ties, scarfs, gloves, polo shirts, etc.

Knitted fabrics of all rayon, and visca and rayon for millinery, enjoyed a satisfactory popularity. In some instances the knitting construction of the fabrics was intricate, but the most popular fabrics had a simple tailored appearance.

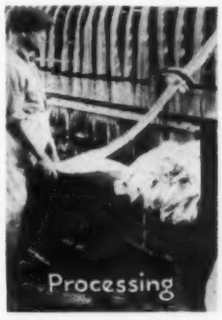
Developments of a mechanical nature include improved fine-gage blocked presses and jack wheels for circular, leaded-needle type machines; furnishing or delivery mechanisms for knitting or laying in Lastex; and an entirely new circular spring-needle machine. This last machine reflects nicely the trend in knitted rayons by offering the advantages of fine gage, a possible wide range of patterns, and ease in changing from one pattern to another.

DURING THE last year the rayon weaver has focused his attention on two points: the avoidance of defects formerly encountered; and experimentation with new weaves, many of them of the so-called trick-weave variety. In the same period of time, improved methods and equipment for warp sizing have made their appearance, one of which, for example, is a machine utilizing the hot-air system of drying. Gelatin-base sizing compounds have continued to gain in favor. Another development of interest is the greater adaptation of the cotton system for the preparation of warp beams by silk mills running on rayon.

In his efforts to prevent streaky fabrics, the weaver has found that uniform winding in the warping department is important, and that where warping is directly off cones, the chances of defects are slighter. Mixing of two or more lots of yarn in a warp is a well-known cause of streaks, and it is recognized that when a lot of yarn is given to the warper he should run down the lot without mixing in a new lot. It has been discovered that in case a warp has been completed and insufficient yarn is left to make another warp, the danger of streaks is minimized by spotting the new lot into every other row across the creel, and not up and down.

We have learned that where controlled humidity in the preparation of rayon warps is impossible, extra precautions must be taken. For example, it is preferable to run the skeins empty and the warping machines empty the last day of the week, so that the yarns will not be subjected to weather changes over the week-end.

In the quilling department, it has been dicovered that uneven tension on the quills will cause a barré effect often noticed in the gray and even more pronounced after finishing. Compensator guides should be carefully checked twice a week and replaced if necessary. The tension should be tested and closely watched so that a uniform tension can be kept on each and every spindle.



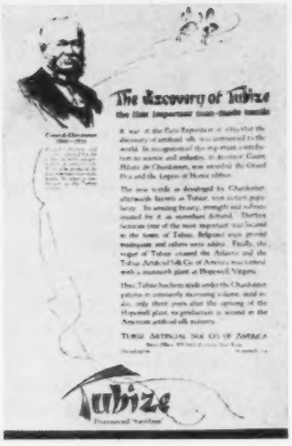
DYERS, PRINTERS and finishers of rayon yarns and fabrics, for the most part, have not attempted to produce any radically new effects, but have concentrated on the improvement and extension of processes developed in previous years. This is true, for example, of the anti-crease treatment and the gray calendering and embossing of rayon crepes. Cotton finishers, when first called upon to process taffetas and other all-rayon constructions, experienced considerable difficulty, which has led to a decided trend toward the adoption of silk finishing type of methods and equipment.

Several new finishing agents, printing gums, etc., have been introduced in the period under review, and the range of dyestuffs for cellulose acetate has been expanded. Of particular interest from the theoretical viewpoint, are the Plurafil colors, which produce nearly identical shades of viscose, cuprammonium, acetate, cotton, wool, and silk. Brought out primarily for use in the garment dyeing industry, these dyestuffs should have some useful applications in the textile industry proper.

Among the improved types of equipment introduced during the last year are included glass-lined dye kettles, an open-width washer designed to give positive tension control, a print-works ager suitable for handling a wide range of fabrics from sheerest voiles to heavy drapery materials, an automatic yarn dryer with protective aprons to keep the yarn from being snagged or soiled against the side walls, and a high-speed cloth measuring and examining machine, with reversing feature.

Two developments originated in England, but apparently not employed in this country as yet, are the printing of rayon fabrics with rayon flocks and the production of an acetylated viscose rayon yarn which is said to be unaffected by prolonged boiling in water and to be insoluble in organic solvents. Mentioned elsewhere in this issue is another innovation of interest to dyers—the spinning of colored yarns, of which a black acetate yarn offered recently by domestic manufacturers is the first commercial example.

In this review of recent developments in handling rayon in the mill, A. Weiss has contributed the section on throwing; H. E. Wenrich, that on warp preparation and weaving; W. E. Shinn, that on hosiery knitting; and Louis G. Goldenberg, that on outerwear and underwear knitting.



First known rayon advertisement to appear in this country ran in "Dry Goods Economist" in 1924. This was shown in recent display by The Fashion Group

Royal Road to Sales

Rayon Industry Promotion Job

1884.....1934

"Artificial silk" sweaters and neckties of yesteryear did not offer an attractive field to high-powered sales executives. Synthetic textiles of today are another story—and a stirring one.

This advertisement was awarded honorable mention for best photograph in trade paper advertising at exhibit of advertising art in New York last spring

IT is doubtful if any aspect of rayon's crowded history carries a more impressive message than the rapid-fire development of the industry's sales promotion. Into the narrow compass of a few years this division has compressed such progress as normally would take many decades to achieve. Contrast, if you will, the labored, wordy advertisements used by yarn producers in selling to mills in 1924, with the artistic, economically-phrased advertisements of 1934. Then too it should be kept in mind that the advancement in advertising was paralleled in other promotional branches. The life of the industry's sales promotion activity has been brief but concentrated; while one or two companies had organized advertising and sales promotion departments between 1924 and 1926, it was not until shortly before the depression that the industry as a whole gave full-fledged identity to these departments. The history of rayon sales promotion, therefore, is largely a record of what has happened in five or six years.

When we examine rayon sales promotion generally, the story submits itself to four main divisions: First, the history of generic terms; second, the changing emphasis as regards promoting to the various consuming divisions; third, the evolution of the rayon advertisement, and fourth, the growth of other promotional methods such as the fashion show, etc.

The history of generic terms has three main phases. Artificial silk came first; this phrase enjoyed general use until a few years before the depression when, at the insistence both of the silk industry and the rayon producers, the term was discarded in favor of the word "rayon," which brought us into the second phase. Now with the advent of such terms as "acetate" and "acetate rayon" and with the increasing popularity of brand names, we are entering a third phase.

In considering the changing promotional emphasis on yarn consuming branches, it should be understood first that the producer has a sales message for four divisions: (a) the mill; (b) the cutter; (c) the retailer; and (d) the ultimate consumer. In the early days the producer thought solely in terms of the mill. Then, when the mill refused to buy yarn on the grounds that its own customers, the cutter and the retailer, were still prejudiced against rayon, the advertising pendulum of the producer swung violently to the other extreme. Promotional effort became centered on the mill's customers; this drive brought splendid results in breaking down sales resistance there but it also meant that promotion to the mill sometimes shrank to imperceptible proportions.

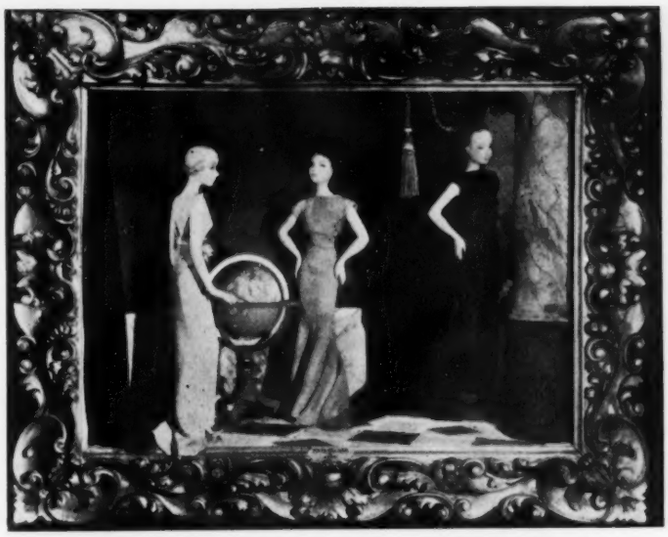
Some advertising executives feel strongly that the industry soon will have to sell rayon directly to the ultimate consumer through the national women's magazines, which would represent a heavy outlay. However, there is also a growing belief that, of late, the mill has been too much ignored in promotion. The chief argument advanced by the rayon executives who favor increased attention to mills is that mills are not fully informed of the degree to which cutter-retailer advertising has increased rayon acceptance among their customers.

Moving to our third aspect, the evolution of the rayon advertisement, we find marked progress both pictorially and textually. Changing promotional trends, of course, were reflected in the advertisement itself. As the promotive effort drew nearer to the ultimate consumer, style and beauty became proportionally more important in the advertising. The same is true of copy directed at mills and cutters; in these divisions today there is a notable absence of the long-winded technical advertisements which were generally used in pre-depression years. The industry now regards the pictorial element as an outstanding aspect of its advertising. Indeed one of the few predictions on which promotion executives all seem to agree is this: That the rayon advertisement of the future will become constantly more artistic and high fashion, and will tie up with noted designers who will serve as authorities in authenticating new fabrics; this trend, of course, will be subject to such modifications as are imposed by needs of the different consuming divisions.

But advertising has been only one instrument in rayon's promotive growth. During recent years practically every modern method of sales promotion has been employed. This includes: fashion shows, educational campaigns, movies, direct mail, house organs (some of these are on so ambitious a scale as to more truly warrant the term magazines), and, finally, the market development work which has been notably successful both in trading-up in outlets, and in developing new uses.

While indications point to a general continuance of this diversified effort, a signal change is taking place regarding the industry's attitude toward the fashion

show. It is clear that, so far as rayon is concerned, the era of the costly and limited "Park Avenue type" of fashion show is nearing its end. This sort of promotion served its purpose in winning high fashion acceptance for the yarn. Now, however, the industry is more interested in reaching the general public, and has steered its fashion show effort in that direction, as witness the recent notable displays by foremost companies at women's club conventions and in leading stores.



"A Masterpiece in Acele"—Part of a window display used by Best & Co., New York, showing miniature manikins by Lester Gaba.

What lessons have been learned in promoting rayons since 1924? Broadly, the answer is that the approach has become more organized. There is less hit-or-miss promotion and consequently less waste. The growth of industry-consciousness in promotion has been very beneficial to the industry as a whole. While the first requirements of a sales compaign, naturally, is that it sells the product of the individual company, sales promotion departments also have come to recognize that they have a common cause and that when they do a good job for their own organizations they also are doing a good job for the industry.

Rayon's sales promotion record is one to be proud of. Post-mortems, of course, always show possible mistakes. It has been suggested, among other things, that progress would have been more rapid, if the original effort had been divided between mill and cutter instead of approaching each group separately to the neglect of the other. That may be true. However, the record as a whole shows surprisingly few missteps. In the main, rayon sales promotion tallied its progress with that of the technical division.

The development of a coordinated and efficient sales promotion policy for the industry was far from the simple matter one might suppose it to have been. With prejudice to be fought and ignorance to be turned to enlightenment, with yarn improvements coming almost daily, and outlets expanding at a breath-taking pace, rayon indeed faced a most difficult sales promotion problem—a problem as unprecedented as that involved in producing the yarn itself. Established methods of textile promotion offered no solution. The only answer lay in the prompt development and energetic prosecution of a new and independent policy. The integral soundness of the policy that was developed, and the vigor with which it was pursued have contributed in no small measure to the present widespread acceptance of rayon.

When we consider current and potential problems confronting the sales promotion division, various vital questions arise. Outstanding among these is the generic term issue. One producer has substituted the term "acetate rayon" for the old term "acetate," continuing however to use "rayon" for the firm's promotion of viscose process yarns. The aim of this action, it is stated, is to clarify the identities of merchandise made from cellulose acetate yarn and viscose process yarn, respectively. "Acetate" is rapidly winning trade recognition as a quality term, and there is a tendency to effect a specific division between "acetate" and "rayon" in promotion.

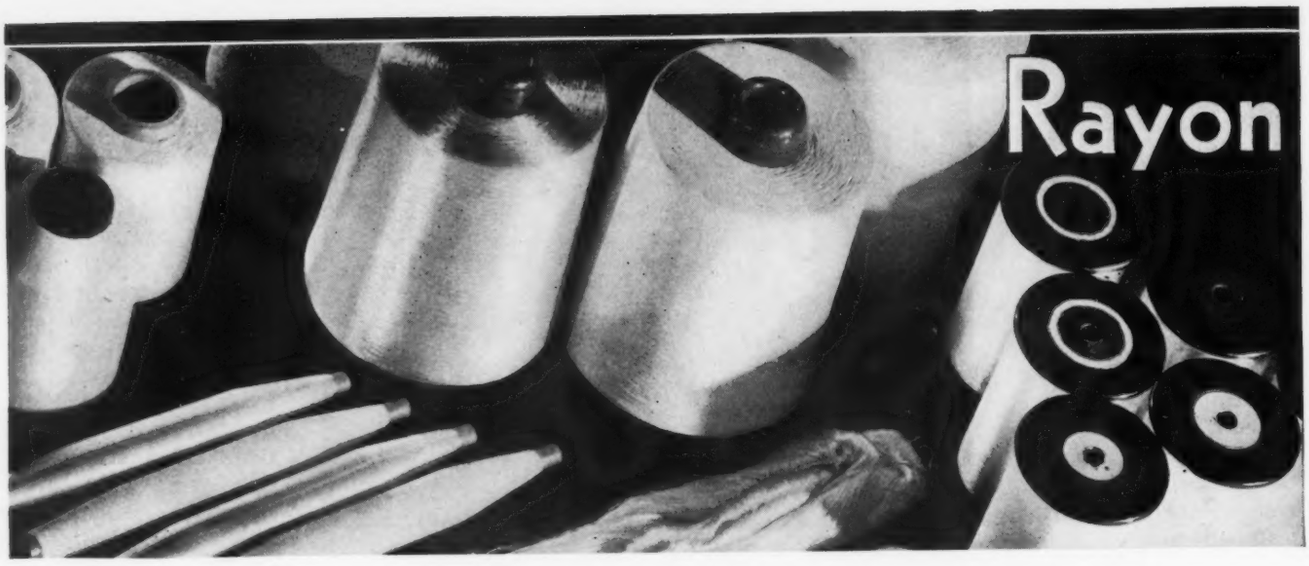
This new aspect of the nomenclature issue is an immediate problem which faces the yarn industry in its plan for a joint promotional campaign with the rayon weavers. As we write, the National Rayon Weavers Association has approved the campaign, and official favorable action by the producers is regarded as certain. Tenative plans provide for a campaign to which weavers and yarn producers will contribute $300,000 each.

How shall proponents of this campaign solve the generic term problem? It may be assumed that a few rayon companies producing only acetate yarn will decline to promote the word "rayon" in any form, "acetate rayon" or otherwise, since the individual prestige and quality of acetate is a major selling argument and from their point of view tacking on the word "rayon" could only be detrimental. The generic term difficulty is interlocked with the whole sales question of intercompetition among processes. The production of yarn by two or more processes is advantageous to a producer for many reasons, among them the fact that it permits the sales promotion department to focus on selling a mill all the yarn the mill may need for mixed fabrics. However, multiple process operations by single companies may eventually prove a serious handicap as regards the independent promotion of acetate yarn, especially if all such producers were to adopt the term "acetate rayon."

With respect to the possibility of intensified consumer advertising in national women's magazines, the question arises: How can this be made effective without a complete label or tag tie-up which would carry the yarn's identity through to the consumer? At present such tie-up is effected only to a limited degree in the industry. Rayon executives recognize this difficulty but as yet they have developed no solution to it.

One major problem as regards the future of rayon sales promotion is its relationship to selling costs generally, and through that, to the selling price of the yarn. If, as the whole history of the industry indicates, rayon yarn prices must stay down to permit continuous productivity and volume movement, then it would appear that the promotional burden would have to be carried not only by the producer but, to an increasing degree, by his customers as well.

The pioneering job, we may safely say, is done. In the short space of a few years, rayon sales promotion has built a national market out of nothing. Yet the job of winning the ultimate consumer to full acceptance of rayon remains around the corner. The women of the United States must be educated to know and acknowledge rayon as a textile having the prestige of fashion behind it. This is the task to which promotion will henceforth direct much of its energy.



1884.....1934

"The trend is distinctly toward a complete taking over of the early processes of the rayon-textile mill by the rayon manufacturer." This one sentence dramatizes the major movement which is taking place in the field of rayon packaging.

THERE was a time—only relatively few years ago at that—when "raw" rayon, like raw silk, could be purchased only in skeins. It then had always to be wound on spools, bobbins, quills, cops, cones, or tubes by the purchaser who wished to twist, weave, or knit it. Now, following a period of evolution in the rayon producer's packaging, the yarn can be purchased in a variety of forms ready to be put almost immediately into productive service. The range of packages is not complete as yet, and some rayon producers offer a greater variety of packages than others, but the trend is distinctly toward a complete taking over of the early processes of the rayon-textile mill by the rayon manufacturer.

And, broadly speaking, the rayon producer has shown himself able to do a better job with these early winding processes than the textile mill, with the exception of the rayon converter, whose important service is outside the scope of this article. The producer or "spinner" is more accustomed to precision and scientific control of processes than is the mill. His plants, on the whole, are better humidified. Finally, as he is obliged to please a customer rather than just another department of a mill, he finds it necessary to prepare a better package. He is in the same position as the sales-yarn spinning mill, which finds it necessary to turn out a better product than the spinning department of a vertically integrated mill.

Take the coning operation, for example. It is apparently impossible to cone rayon without at least a slight stretching of the yarn. Abnormally stretched yarn, although not of great moment to the knitting mill, causes shiners in woven fabric. It is therefore to the advantage of the weaving mill to have its cones wound under the most propitious conditions. Also, there is an advantage to the mill in being able to place the responsibility for unsatisfactory coning on the shoulders of the rayon producer, thus by-passing the cost of the damage around its own coffers. The same advantage accrues to the mill in having its packaging performed by the rayon converter. Unfortunately, however, unfair advantage is not infrequently taken of this situation by the mills, and claims for damages have been made on the basis of coning which actually was superior to anything the mill itself could have done.

It is largely because of the vulnerability to damage claims which coning and other packaging foists on the rayon spinner that he looks with some anxiety upon the trend toward greater variety in packaging. He can guarantee his skeined rayon with practically no qualification; but when he comes to carry his processes a stage of two further, he steps from the rôle of raw-material producer into the additional rôle of textile manufacturer—wherein no man has as yet attained such uniformity and scientific control of operations as are now common to rayon spinning. If it were not for the unfairness of many mill claims, the trend toward varied packaging would have progressed further and more rapidly than has been the case to date. If the mills wish to benefit to the fullest extent from the ability of the rayon spinner to produce a better package, and to do so at lower cost, they must arrange with the spinner for fair degrees of tolerance.

Furthermore, the mills must be prepared to pay a reasonable amount for the packaging. The fact that they are not now doing so is, however, largely the fault of the rayon producers, who have been up to the old game (from which they have shown signs at various times of departing) of cutting each other's throat. The result is that today coned 150-denier rayon can be purchased at the same price as skeined 150-denier rayon. Naturally, the rayon producer is not interested in taking over many textile-mill processes if he is not to be paid for doing so.

Recently there has been some selling of sized and tinted cones to throwsters, thus enabling the manufacturers of crepe yarns to dispense with their earliest operations and to obtain higher production on their winders and spoolers. At first the doped cones did not prove satisfactory to all throwsters; but as the sizing departments became experienced, more throwsters found the product acceptable. It would seem that if a producer employs skilled labor, maintains efficient chemical control, and buys the best ingredients, he should be able to meet the requirements for sized rayon. To maintain these

Packages . . .

Producers Are Relieving Mills of the Early Winding Operations

*By Joseph H. Shinn**
Consulting Textile Engineer

conditions, however, he must receive a fair price for his service.

The type of package which the rayon spinner is most anxious to shy away from is the spool, particularly the small 4-oz. silk type of spool known as the double-head bobbin. This bobbin fits conveniently in the creels of silk-type warpers, and doped rayon wound on it can be placed immediately on the spindles of the throwster's twisters. All well and good from the angle of the mill; but the spinner has not only the doffing expense caused by small packages, he has an enormous bobbin inventory on his hands. Besides the clerical work of keeping track of the bobbins, he is faced with the necessity of counting and carefully inspecting returned bobbins. Experience in the past has disclosed a tendency on the part of some mills to retain bobbins shipped to them at least long enough to make up for perhaps a temporary shortage in their own inventory. The result of all this is that today many spinners will supply nothing better than the large ½-lb. spools of the cotton type. A solution to this silk-bobbin problem may eventually prove to be a new paper single-head bobbin, which is of about the same size. This bobbin was developed primarily for sewing-thread trade, but it appears well qualified for the same purposes as the double-head bobbin and adapted to overend delivery.

Objectionable as the trend toward more complete ranges of packages may be to the rayon manufacturer, the benefits to the textile mill are such that the trend will continue. Already, rayon is sold on regular cones, oiled cones, pigtail cones for magazine creels, bottle bobbins, spools, double-head bobbins, parallel tubes, and (in the case of some acetate) cops. Shortly it may be available on single-head paper spools and pineapple cones.

Change has taken place in the size of the various packages wound by the rayon producer. The 30,000-yd. skein is one of the recent innovations. In winding the skein onto cones, tubes, or bobbins, the number of knots is reduced and a greater number of spindles can be attended by an operator. A 30,000-yd. skein of 150-denier rayon is equal in weight to about 1 lb. Three of such skeins, wound onto a cone without a break in any one of them, would mean only two knots to the cone. Not long ago a 2 lb. cone would have at least eight knots.

When rayon was first wound onto cones, a 1½-lb. cone was considered the proper package, and no moisture or oil condition was guaranteed. Then came the adoption of a 2-lb. cone with moisture and oil content guaranteed. Today we have the 3- and 4-lb. cones containing a standard amount of moisture and the correct amount of oil for the trade to which the rayon is shipped.

The putting up of a synthetic yarn on anything but a perfect foundation would be a serious drawback to the satisfactory running of the yarn. It has been proved that the surface of containers must be smooth and soft for fine-denier filament yarn, and what is good for fine yarn is good also for coarse. New surfaces which have been developed on cones, especially for rayon, are known by such appropriate names as "Velvet" and "Satin." Special attention has been given to the improvement of cone tips, which are reinforced and made relatively slippery by the use of lacquer, metal, etc.

Parallel to the package evolution is an evolution in methods and materials used for preparing rayon for shipping. When we look back over the past few years and recall some of the poor and mutilated ways in which synthetic yarns were put up and shipped to the trade, the improvement is evident.

In contrast to the old type of heavy-board packing case, rayon skeins, cones, and spools are shipped today in cases of uniform size constructed of a light and tough plywood which is especially made for the purpose and will withstand most any rough handling. The cases are lined with moisture-proof paper which acts as an insulator, keeping excess moisture out of the case and away from the material and, at the same time, helping to retain in the material the standard amount of allowable moisture. Further to insure safe delivery and undamaged material, the producer packs each cone in an individual cardboard container which holds the cone of yarn securely in the packing case. The acetate or rayon yarn on the outside of the cone does not touch any part of the container. Spooled fine rayon is packed and shipped in paper-tube containers. Cellophane has been used as a wrapping; but because of the low price of rayon and of the high cost of Cellophane as compared with waxed paper, it has been largely abandoned for the time being.

One producer has developed a special type of bundle-wrapping for skeins which does away with the use of string. Bands around the outer and inner wrappings are easily severed by pulling on small tabs provided for the purpose. The skeins are securely wrapped and no knife or scissors are required.

*For the materials used in the illustrations for this article, including the frontispiece on page 64, I am indebted to Du Pont Rayon Co., American Bemberg Corp., and A. M. Tenney Associates. Other producers have aided in supplying information.

Who Will Weave

Rayon Fabrics of the Future?

1884.....1934
RAYON arrived on the scene when the textile industry, as we know it, had already crystallized into recognized branches. It was only a raw material which somebody already in textile manufacture might use to advantage. Since then it has cut a brilliant path across nearly all branches, and without much conscious planning, a new alignment is working itself out.

FOR years treated as a visiting relative by cotton and silk mills, that little lady, Rayon Weaving, has been exhibiting signs of independence. Every so often she is heard to mutter that she is big enough to have a house of her own, or at least a separate suite in the cotton and silk mills. Where will Rayon Weaving be domiciled in the future?

Starting out on fairly safe ground, it can be assumed that the bulk of rayon-cotton mixtures will continue to be made in cotton mills and that rayon-silk mixtures will be made in silk mills. That leaves the future of all-rayon fabrics to be determined, and here the trail is obscured by various economic factors.

Mass production and its relation to cost is the first problem. Cotton mills, even the fine-goods mills, are definitely on a mass-production basis when compared with silk mills, where the large unit is the exception rather than the rule. The latest entrants in the field, mills weaving rayon almost exclusively, as exemplified by Burlington Mills, Inc., have tended to be set up on the mass-production basis. Disregarding equipment and personnel for the moment, it would appear that the average silk mill is out of the picture, due to costs, when it comes to any rayon fabric for which there is sufficient demand to justify large-scale production. An interesting sidelight is that many in the cutting-up trade predict that rayon fabrics will displace cottons to an increasing extent in dresses retailing for around $3.75—and that means volume demand. Does it mean that the average silk mill should throw rayon out? Not at all. Type of fabric, equipment and personnel must all be considered.

Although many in the trade have not stopped to analyze the situation, the question of silk mill vs. cotton mill has shown signs of clarification during the last year or two. The settling-down process can best be shown by trends in the groups weaving all-rayon fabrics:

1. *Cotton Mills.* The ordinary cotton loom can, with relatively few changes, produce plain rayon weaves. With the addition of cop winders, and perhaps a rayon-type slasher, the cotton mill is all set to go on taffetas, etc., and can produce them economically. Other weaves require the silk type of loom. There is nothing to prevent a cotton mill from installing looms, and auxiliary equipment, similar to those used in silk mills. This has been done and undoubtedly will be done in the future. The significant fact is that cotton mills do not install such equipment, and do not train or secure the necessary personnel, unless reasonably assured that there will be mass-production demand for the type of fabrics under consideration.

Another significant trend among cotton mills is segregation of rayon weaving. Thus we find the rayon-weaving unit of Pepperell Mfg. Co., although using cotton looms and located in a cotton mill, is definitely set apart from the cotton weaving. This feature is particularly noticeable where a cotton mill has installed the silk type of equipment. Constructions made on silk looms require a different operating technic and are thus best segregated. Whether more and more cotton mills will develop what might be called a "silk-mill" division will depend upon whether demand justifies the cost of installing suitable equipment.

2. *Silk Mills.* This group must be divided into the relatively small number of large units, and the vast majority of mills having anywhere from 20 to 200 looms. Most of the large units have not gone in heavily for all-rayon fabrics, preferring to use all-silk or silk-rayon mixtures. A few, however, produce all-rayons on a mass-production basis. The significant point here is that such mills are striving to produce only such fabrics as cannot be made on cotton-mill equipment. Thus we find the emphasis on constructions requiring a 4x4 loom, etc.

The average silk mill that tried, or is still trying, to compete on ordinary rayon constructions has taken it on the chin. Such mills simply are not economically suited to supply a mass-volume market. Not unnaturally, many in the industry are pretty sour on rayon at present and "back to silk" cries are heard. Looking to the future, such an attitude does not appear particularly sound. Without going into the various ramifications of the problem, it is a reasonable supposition that the reason for the existence of so many small units in the silk industry is that they are suited to meet the needs of a market where style is predominant and where short runs and rapid changes are necessary. The average silk mill can and will in the future make the rayon fabrics it is suited to make—namely, the quick-changing style lines that the mass-production cotton mill cannot handle.

3. *Rayon Weaving Mills.* Mills handling rayon almost exclusively are a comparatively recent development. Such mills usually have both the cotton and the silk types of looms and operate on large-scale production. In competition with cotton mills and large silk mills, they have the benefit (and, on occasion, the disadvantage) of specializing on one type of raw material.

Whether the number of such mills will increase markedly in the future is one of those problems that the future alone can answer. Indications as present are that there will be a fair, but not spectacular increase.

In summing up the whole question, it may be said that the rayon fabrics of the future will be made where they can be produced most economically and that the phrase "most economically" depends on the construction and the demand.

Up to the present, the merchandising angle has not been important—cutters will cut most anything they can make a nickel on.

Yes, little Rayon Weaving is growing up. She has a few homes of her own where she is queen and she has some pleasant suites set aside for her in cotton mills.

Rayon's Little Brothers

Synthetic Fiber Family Has Many Promising, Though Still Minor, Members

1884.....1934

This is a roll-call of the rayon family for 1934. The members are all relatively young and many of them are likely to have long and useful lives. Chardonnet and his co-workers certainly started something.

RAYON is not the only descendent born of Hooke's dream in 1664 and Count de Chardonnet's realization in 1884. Rayon has numerous little brothers who are all obviously of the fiber family but, through various stepfathers, have somewhat different characteristics from the giant first-born. Inventors have been adding year by year something new in product or process until synthetic fibers have become in themselves a basic industry rich in potentialities.

In addition to the filament product based on Chardonnet's fundamental discovery, there is a separate family of sheet products including films and transparent wrapping materials. This family has made a reputation for itself in various fields, only lately introducing a textile offshoot in the form of spinnable and weaveable materials. These might be called rayon's cousins.

It's a big family all in all. Let's call the roll!

Staple Fiber. This is the senior among the younger brothers, and is the most robust. It is multi-filament rayon, usually spun with a total denier of about 2,400, composed of 750 filaments with average individual denier of 3. Where a finer filament than 3 denier is required, the yarn produced is usually smaller, with fewer filaments. This multi-filament yarn is later chopped up in any required staple length. The resulting fiber may be spun on cotton or woolen machinery, alone or mixed with other fibers. The first recorded patent relating to staple fiber (A. Pellerin, of France) about 25 years ago did not result in commercial production. Paul Girard (also of France) obtained a patent in 1912 on which future development was based. Wartime in Germany with scarcity of cotton and wool witnessed first the increased use of rayon waste, and later of rayon spun primarily for staple fiber. Stapelfaserfabrik Jordan Komm, Gesellschaft, near Stettin, is named as the first large-scale manufacturer. Staple fiber is now made by many rayon producers, principally of viscose but the cuprammonium and acetate processes occasionally are used. Foreign producers have been more active than domestic in producing and improving their staple fiber. A revival of interest in this material is now current, notably in Japan and Germany. In the domestic market Viscose, DuPont, and Bemberg produce staple fiber and imported makes are available. In 1932 the United States produced 990,000 lb., while Germany produced over 1,000,000 lb. Staple fiber's market development is quite separate from rayon and its progress will doubtless rest on the nearness of approach toward cotton and wool spinning characteristics which it may achieve. If synthetics are to be used on existing preparatory and spinning machinery, it will probably be in the form of staple fiber.

"Artificial Wool." We apologize for use of a phrase which should be banned as a misnomer until a serrated fiber is synthesized. The material usually thus miscalled is rayon waste or staple fiber to which crimp or curl has been imparted. Fabrics made from it have a warmer handle than those of smooth, straight fibers, consequently the opportunity to mix with, or substitute for, wool. In general such fibers are still too smooth to duplicate the spinning qualities of wool or cotton. The materials were promoted when 1925 and 1926 witnessed the introduction here of Sniafil and Chatilaine from Italy, both viscose. Lately has come Woolan, also from Italy. In 1932 British Celanese announced an acetate "artificial wool." There is continuing experiment to produce synthetically a duplicate of the natural short-fibers.

Hollow-Filament Rayon. Under the microscope these filaments appear as flattened tubes with rough exterior and smooth interior. Gas bubbles in the viscose solution produce the effect. Celta, made by Kemil, Ltd., of England is this sort of material. It has not been widely used in this country, but the principle stimulates the imagination as a closer approach to the structure of animal fibers.

Artificial Horse Hair. A large single-filament yarn, usually 300 to 450 denier, round or flat, used for interlinings, decorative braids, and millinery. It is produced in only limited quantities in this country. First production was in Germany in 1900.

Artificial Straw or Ribbon. This product is used principally in millinery trade. It is a viscose material, the solution being forced through spinnerets with a thin slit $\frac{1}{10}$ to $\frac{1}{4}$ in. wide. Bright and dull is made by DuPont and Viscose.

Cut Viscose Sheet. This is a variation of staple fiber. Viscose sheet (such as Cellophane) is trimmed in minute strips, of which the width is not much greater than the thickness. The cut edges are saw-like when viewed under the microscope, and this characteristic is said to give good spinning qualities. The fiber is used only in mixture yarns, as it lacks strength. If cut from colored sheets, the effect of dyed fiber is produced. Various cross-dyed effects are possible by proper mixture of fibers and selection of dyestuff.

Viscose Sheet Ribbon. Again the transparent wrapping material shows a textile use, when prepared in ribbon form for weaving with yarns of various sorts into decorative fabrics, such as Luvet. The ribbon is also twisted on itself or on yarn, principally for millinery use.

True Synthetic Fabrics. Various patents running back to 1898 have been granted for synthesized lace or fabric. Extruded viscose is laid on a traveling belt which carries it into the coagulating bath. It is laid by one or more movable heads in the desired form of fabric or lace.

Acetylated Cotton. This is straight cotton fiber so treated as to develop cellulose acetate on the fiber surface. This gives it the dyeing and water-resistant qualities of cellulose acetate yarn. Experimenters similarly treat viscose rayon.

Lastex. This consists of a core called Lactron covered with a textile yarn. The fineness of the core gives enhanced quality to elastic textiles. This core is formed by extrusion of latex, a method which doubtless had its inspiration from synthetic yarn manufacture.

Pulp Yarns. Experimentation with pulp for rayon manufacture has led to work with the pulp itself as a textile material. Yarns for certain purposes have been successfully produced, as for example Solka.

The Consumer Speaks:

How I Looked at Rayon Five Years Ago and Now

By Lillian Edgerton
Edgerton Laboratories, New York

1884.....1934

It is not necessary to go back to 1884 in tracing the trend of consumer reaction to rayon. In just the last five years, the change has been spectacular. The author of this article has had an excellent opportunity to study this problem. . . . Incidentally, she is not a Pollyanna; she doesn't pretend that producers have no more work to do in this direction.

THE last five years have brought a remarkable change in customer attitude toward fabrics made from synthetic fibers. Recently an extensive survey was made to determine the customer response in June and July of 1934 as compared with the response of the same group of women five years ago.

The results of the survey indicate a right-about face from the previous opinions. Perhaps this is due in part to the tremendous amount of publicity given by rayon firms, and in part to the progress made in producing saleable, practical and style-right garments of synthetics.

At first, rayons were considered a substitute for silk, and a substitute seldom, if ever, has the inherent characteristics of, or receives the respect given to, that which is imitated. Therefore, in the mind of the average woman customer, rayon fabrics were meant to take the place of silk material which was too expensive for the low-salaried girls to wear. This enabled the latter to use fabrics which gave them a feeling and appearance of being as well-groomed as their more prosperous sisters.

The most widely used rayons at first were the heavy, shiny baronet satin type used for costume slips under sheer fabrics, making a shimmery ensemble for dress-up occasions. Also, these slips contributed to the use of wool dresses by preventing them from clinging to underthings.

The first rayon fabrics, however, received considerable criticism from the women consumers. The very characteristic of shininess which was a selling point to one group of women was a fault to a larger group. The knit underwear that, when new, would fit a fourteen-year-old girl neatly, after two washings would do very well for a modern Katrinka. Not only that, but a deep blue costume slip after a very few launderings would in some cases appear an off-white, and rayon drapery materials that had been purchased to complete an interior decorative scheme would, under very little exposure to sunlight, become faded and splotchy.

Rayon yard goods presented raveling difficulties for the home sewer. Seams were difficult to bind in time to save the seams, and a rayon dress, whether home or factory made, was a subject of great care in wearing lest a slight strain on seams or pleats separate the threads sufficiently to give an unfinished hemstitched appearance.

Added to the disadvantages of high gloss, slipping threads, fugitive dyes and water-weakened yarns, was the fact that salespeople lacked real information on successful care and handling of such fabrics. This led to statements which were a combination of bluff, indifference and/or misinformation, causing loss of confidence in anything the salespeople might say. To offset such a condition, manufacturers endeavored to promote specific lines of fabrics which were constructed to eliminate the previous difficulties. It was necessary then to promote these lines in order to make the customer acquainted with the inherent excellent qualities.

These were the opinions of women four and five years ago, but in the meantime, the attitude has changed considerably and is still changing. No synthetic fibers are accepted as a separate group which comprises a material entirely different from the natural fibers and which has its own inherent characteristics and selling qualities.

To the woman consumer, there are still too many trade names. They feel there should be a generic term for the whole group of chemically made fibers. If trade names continue to be used, the customer wants garments and fabrics labeled so she may know when she purchases that she has bought that fabric which, by test and advertising claims for it, has the characteristics which she is looking for.

The washability of fabric has become such an issue that it is one basic requirement of customers. "Will rayon fabrics wash without fading and shrinking so much as to make the garments unsatisfactory for wear?" is a question often expressed in women's group discussions. Considerable progress has been made in publishing laundering rules to advise the customer how best to take care of specific fabrics. There now appears to be little, if any, criticism of the weakness of fabrics in washing. It is no more a point of contention, as the strength of both knitted and woven materials has been considerably increased.

The last five years have also brought a greater selling factor in the form of up-to-date colors, designs and styles which make this group of fabrics more attractive and appropriate for the type of wear for which individual fabrics are intended.

Seventy percent of the women interviewed said they would rather have a satisfactory rayon than an overweighted silk. Many prefer a natural-appearing low luster as acquired by high twist and variation in construction, in preference to the recent chalky finishes.

Summing up the consumer reaction toward rayon, it would seem to make little or no difference to the consumer of the fabrics what the name is so long as it—

1—Cleanses easily and economically and maintains its color, style and size.

2—Gives adequate consumer-wear for the purpose for which the garment is intended.

3—Pleases her in so far as style, comfort, handle or draping is concerned.

Rayon's First 50 Years

How It Was Conceived, Born, Adopted, and Put to Work

SOMEONE in the dim distant past—possibly a prehistoric bookkeeper with five children and a home in the suburbs—first conceived the idea of simulating natural fibers.

It seems impossible to identify the gentleman (or was it a lady?) any more closely than that. The dimness of the past will be realized when it is stated that the Chinese, some thousand years before Christ, are supposed to have collected the excrement of silk worms and to have drawn it out, with a needle, into a thread. One of the early cases of artificial aid to agriculture, possibly—sort of a Chinese AAA.

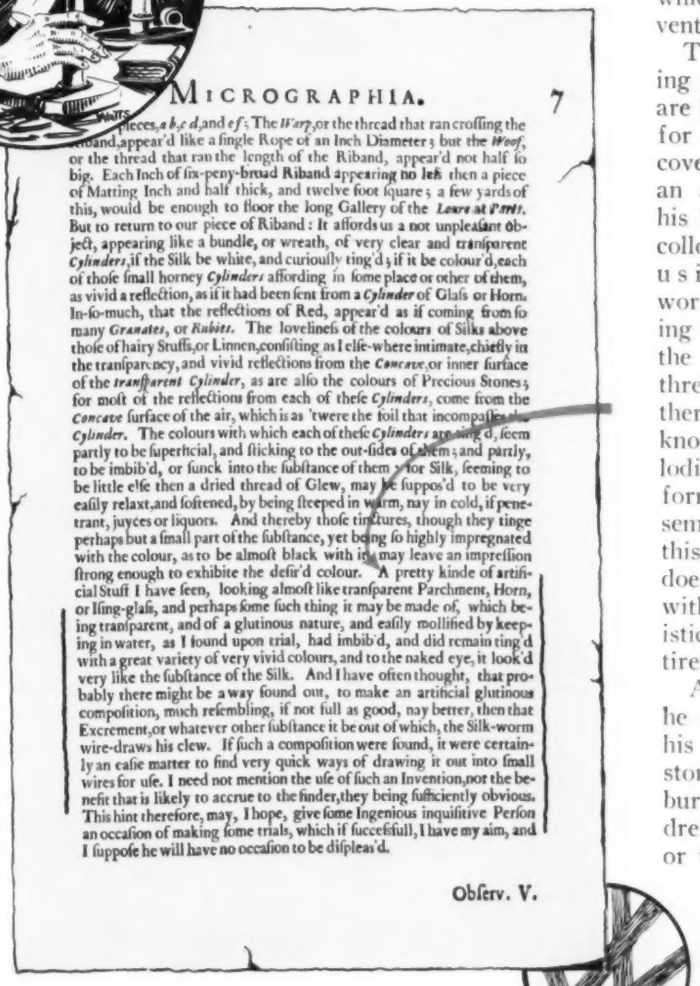
But it seems necessary to skip some twenty-five or more centuries. The year is 1665; the place, Manchester, England. One Robert Hooke, a rising scientist, having developed a microscope, goes out into the high-ways and by-ways to secure samples which he may examine. One day he is given what he records as imitation silk. This chance inspires Hooke to produce what seems to be the first printed prediction of the rayon industry, more or less as we know it today. We reproduce this remarkable document on this page.

But we are still a long way from our real starting-place, and although there are many enticing names and dates during the next two centuries, we can barely pause at them. There were Reaumur (1734) who first explained intelligently the methods of the silkworm in forming silk, and conceived the idea of accomplishing the same result artificially; Keller (1840) who invented a mechanical method of producing wood-pulp; Schwabe (1842) who developed a machine for producing artificial silk; Audemars (1855) who took out an English patent for drawing out filaments on a needle more or less as the Chinese had done some 3000 years before; Swan who (1856) worked on nitrocellulose for photographic purposes and laid foundation for subsequent denitration of artificial silks, and who (1883) got a patent for a spinnable solution, a spinneret, a precipitating bath, and a denitrating process; Ozanium (1862) who suggested the now universal method of producing filaments by forcing a solution through fine holes—and a host of others, whose genius, struggle, and often agony, form an unforgettable part of the saga of man-made fibers.

However, we are gathered here today to celebrate the 50th anniversary of what is generally conceded to be the birthday of the rayon industry: the taking out of a patent, by Count Hilaire de Chardonnet, in 1884 for making artificial silk. This historic document (French Patent 165349) contained a description of a process of preparing nitrocellulose and squirting an ether-alcohol solution of it through minute apertures into heated air which removed the solvent.

The legends surrounding de Chardonnet's work are legion. It is recorded, for example, that his discovery was due partly to an accident: that he got his hands messed up with collodion which he was using in photographic work, and that on stretching his fingers he noticed the collodion formed fine threads. It is stated further that one day he knocked over a jar of collodion and found it had formed fine threads resembling silk. However, this element of chance does not seem to fit in with his known characteristics of patient effort and tireless work.

Again, it is stated that he overlooked denitrating his product—and there are stories of a lady either burning to death when her dress burst into flames—or that she nearly burned



MICROGRAPHIA. 7

pieces, *a b, c d*, and *e f*; The *Warp*, or the thread that ran crossing the Riband, appear'd like a single Rope of an Inch Diameter; but the *Woof*, or the thread that ran the length of the Riband, appear'd not half so big. Each Inch of six-peny-broad Riband appearing no less then a piece of Matting Inch and half thick, and twelve foot square; a few yards of this, would be enough to floor the long Gallery of the *Louvre at Paris*. But to return to our piece of Riband: It affords us a not unpleasant Object, appearing like a bundle, or wreath, of very clear and transparent *Cylinders*, if the Silk be white, and curiously ting'd; if it be colour'd, each of those small horney *Cylinders* affording in some place or other of them, as vivid a reflection, as if it had been sent from a *Cylinder* of Glass or Horn. In-so-much, that the reflections of Red, appear'd as if coming from so many *Granates*, or *Rubies*. The loveliness of the colours of Silks above those of hairy Stuffs, or Linnen, consisting as I elsewhere intimate, chiefly in the transparency, and vivid reflections from the *Concave*, or inner surface of the *transparent Cylinder*, as are also the colours of Precious Stones; for most of the reflections from each of these *Cylinders*, come from the *Concave* surface of the air, which is as 'twere the foil that incompasses the *Cylinder*. The colours with which each of these *Cylinders* are ting'd, seem partly to be superficial, and sticking to the out-sides of them; and partly, to be imbib'd, or sunck into the substance of them: for Silk, seeming to be little else then a dried thread of Glew, may be suppos'd to be very easily relaxt, and softened, by being steeped in warm, nay in cold, if penetrant, juyces or liquors. And thereby those tinctures, though they tinge perhaps but a small part of the substance, yet being so highly impregnated with the colour, as to be almost black with it, may leave an impression strong enough to exhibite the desir'd colour. A pretty kinde of artificial Stuff I have seen, looking almost like transparent Parchment, Horn, or Ising-glass, and perhaps some such thing it may be made of, which being transparent, and of a glutinous nature, and easily mollified by keeping in water, as I found upon trial, had imbib'd, and did remain ting'd with a great variety of very vivid colours, and to the naked eye, it look'd very like the substance of the Silk. And I have often thought, that probably there might be a way found out, to make an artificial glutinous composition, much resembling, if not full as good, nay better, then that Excrement, or whatever other substance it be out of which, the Silk-worm wire-draws his clew. If such a composition were found, it were certainly an easie matter to find very quick ways of drawing it out into small wires for use. I need not mention the use of such an Invention, nor the benefit that is likely to accrue to the finder, they being sufficiently obvious. This hint therefore, may, I hope, give some Ingenious inquisitive Person an occasion of making some trials, which if successfull, I have my aim, and I suppose he will have no occasion to be displeas'd.

Observ. V.

Rayon predicted 270 years ago on page of Hooke's book printed in 1665.

Count Hilaire de Chardonnet who saw his 1884 brain-child mature into a great industry

sary of his great invention has been marked by announcement of intention to close the last plant in the world operating under his—the nitrocellulose—method.

This early historical section of this article is supposed to be primarily a birthday-story about de Chardonnet, but brief reference must be made to the other three major processes which have become such vital parts of this industry.

Although the cuprammonium process was employed by Weston in 1884 for production of filaments for lamps, the first patent was applied for in France in 1890, by Louis Henry Despeissis, for the use of ammoniacal solution as a solvent for cotton cellulose. He died before the patent was accepted—and consequently, under the then French patent law, it was not published, merely a synopsis being recorded in a French publication.

In 1897, H. Pauly received a German patent for a process similar to, but a modification of, that of Despeissis. In 1899, M. Fremery and J. Urban took out their first patent embodying the details of the process; this, in conjunction with the important research of E. Bronnert, led to the founding of Vereinigte Glanzstoff-Fabriken, of Elberfeld, Germany. Further, and important, contributions were made by R. Linkmeyer, A. Bloxam, and J. Bemberg. The latter's work was mainly along the lines of preparing an ammoniacal solution with a minimum of ammonia, and in the mechanical details of spinning.

The story of the development of the viscose process, now the world's major method, has been told many times. Those who contributed most to it were Cross and Bevan, the inventors of the viscose solution, who took out pat-

Monument to memory of Chardonnet at Besancon. He died in 1924

Courtesy Tubize-Chatillon

to death, or that she might have burned to death if her dress had caught fire. (We've never gotten that story straight.) In any event, it seems to be a matter of record that de Chardonnet was forced to adopt Swan's denitration method—and that he also used the system of orifices proposed by Ozanium.

The inventor went further, he became a developer and promoter. At the Paris Exhibition of 1889, despite the high inflammability of his product, his samples received a Grand Prix. He established a plant in Besancon, France, his birthplace. By 1891 he had an output of 50 kilos a day, which increased to about 2,000 kilos daily by 1907.

The fascinating fact about de Chardonnet's life and work was that he lived to see his brain-child mature into a great industry. He died in 1924, when synthetic fiber manufacture had become one of the thrilling industrial romances. By dramatic coincidence, the golden anniver-

ents in Great Britain in 1892; Topham, who in 1902 perfected his centrifugal spinning box; and Stern, who developed the ageing process.

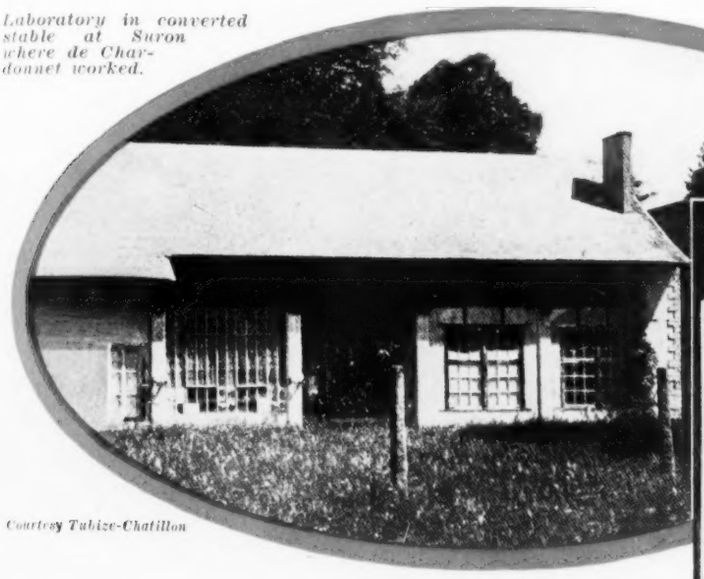
The early development was in connection with lamp filaments—as so much of the pioneering effort seems to have been—but Topham's spinning pot started the process on the road which has brought it to its high position today. Samuel Courtauld & Co. acquired the Topham patents and also the British rights of Cross & Bevan—and the Courtauld name has been prominent in viscose manufacture ever since.

The fourth major process, the cellulose acetate method, has had a long background. Produced for the first time, apparently, in 1869 by Nandin, it became the object of effort toward commercial utilization, by Cross & Bevan

from 1890 to 1894, by Miles from 1894 to 1911, and by A. D. Little and associates from 1902 to 1905.

Its major commercial development as a textile fiber, however, was due to Henri and Camille Dreyfus. The former took out a French patent in 1911. The trademarked product Celanese, now known throughout the world, was the result. Subsequently, many other firms entered the acetate field, and the growth of this particular process has been one of the spectacular phases of recent years.

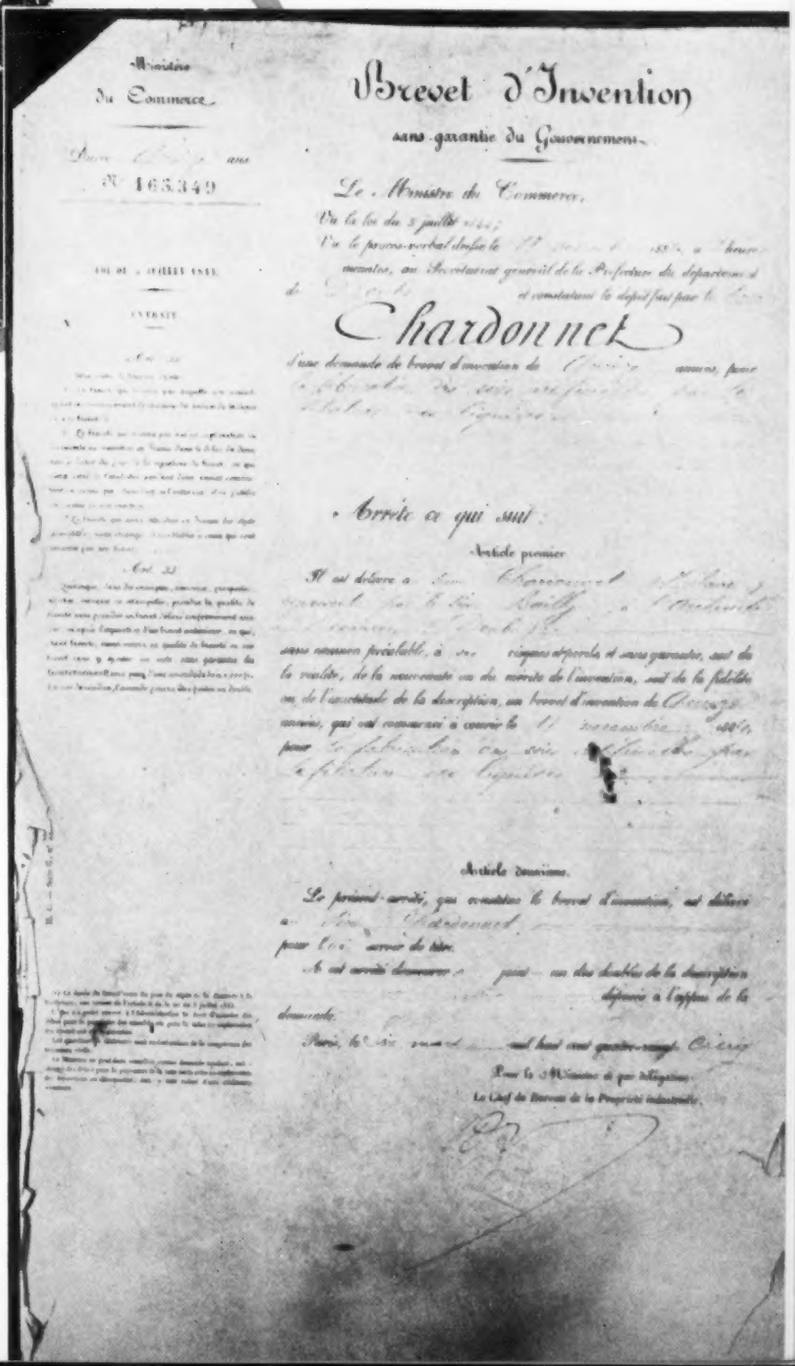
The writer reluctantly leaves this historical reminiscence and turns over to an associate the preparation of the second section of this article, covering the growth of the industry in this country. Before leaving, however, he is reminded, for no reason at all, of a comment in Hard's "Romance of Rayon" to the effect that rayon and the safety razor are the two great inventions of recent times; one discovered the legs of woman and the other discovered the face of man.



Laboratory in converted stable at Suron where de Chardonnet worked.

Courtesy Tubize-Chatillon

First page of de Chardonnet's historic French patent for making "soies artificielles"



Ministère du Commerce

Brevet d'Invention sans garantie du Gouvernement

N° 165349

Le Ministre du Commerce,

Chardonnet

Arrête ce qui suit :

Article premier

Article deuxième.

Pour le Ministre et par délégation,
Le Chef du Bureau de la Propriété industrielle.

•

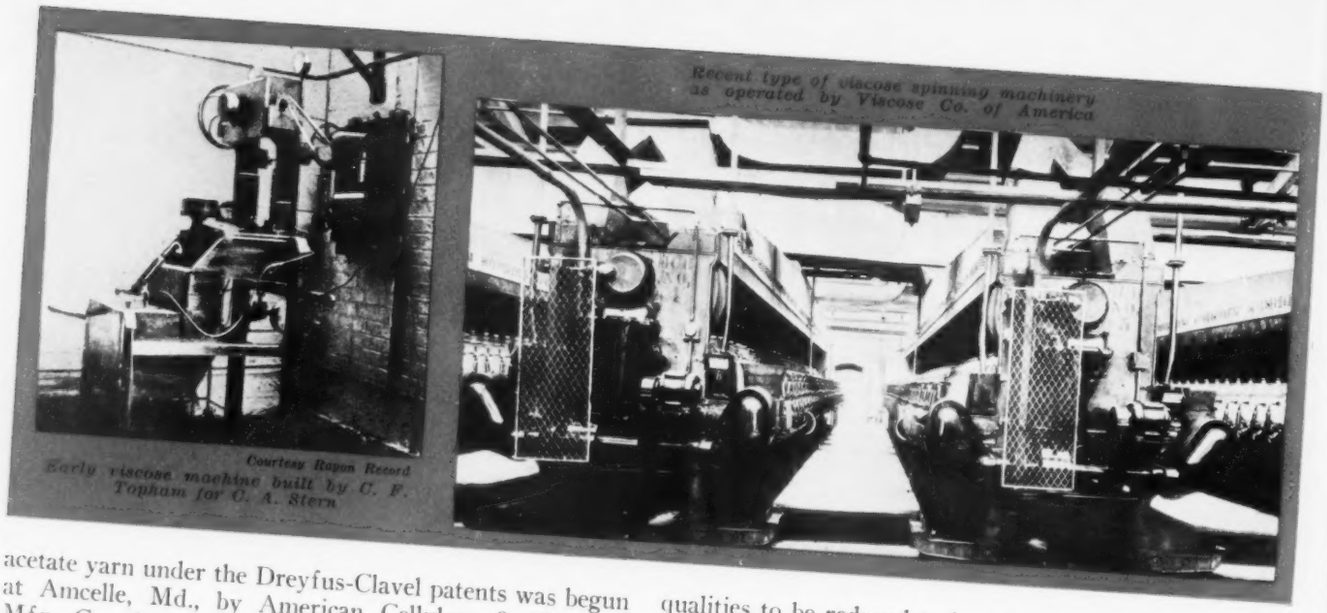
Rayon in the United States

ALTHOUGH the annual world production of rayon had climbed to about 10,000,000 lb. by 1910, none had been produced commercially in this country. The following year, however, the Viscose Co. had concluded arrangements with Courtaulds, of England, and started operations at Marcus Hook, Pa., with an output of 320,000 lb. in 1911. Organization of this company was due largely to the influence of Samuel A. Salvage, who had been one of the first to visualize the possibility of rayon and since early in the 20th century had been active in its importation into this country. In 1912 production of the Viscose Co. was 1,120,000 lb.; and in 1919, over 8,000,000 lb., or about 20% of total world output. In surveying the subsequent phenomenal growth of the synthetic yarn industry in this country, we should not lose sight of the part played by this pioneer organization in overcoming the early antipathy to artificial silk and in paving the way for its almost universal acceptance both by the textile manufacturer and the consumer.

One of the next companies to be established in this country was the Tubize Artificial Silk Co. of America (now Tubize-Chatillon Corp.), an outgrowth of the plant founded by Count Chardonnet at Tubize, Belgium, in 1890. This organization began production of nitrocellulose yarn at Hopewell, Va., in 1920. The same year saw the formation of Du Pont Fibersilk Co. with a plant at Buffalo, N. Y., to produce viscose yarn under patents secured by merger with the Comptoir des Textiles Artificiels of Paris, France. Likewise, it witnessed the consolidation of the American Borvisk Co. with Snia Viscosa, of Italy, resulting in the Industrial Fibre Corp. of America (now Industrial Rayon Corp.), which erected a plant at Cleveland, Ohio, also for production of viscose rayon.

In the next three or four years well over 100 firms organized or attempted to organize; many of these vanished almost as quickly as they appeared; some were purely stock selling schemes; a few are still in existence. It was during this period—in 1924, to be exact—that the word "rayon" displaced "artificial silk" as a generic name for synthetic yarns of the viscose type.

In 1925, manufacture of cellulose



Courtesy Rayon Record
Early viscose machine built by C. F. Topham for C. A. Stern

Recent type of viscose spinning machinery as operated by Viscose Co. of America

acetate yarn under the Dreyfus-Clavel patents was begun at Amcelle, Md., by American Cellulose & Chemical Mfg. Co., Ltd., (now Celanese Corp. of America). In 1926, following an arrangement between J. P. Bemberg, Ltd., and Vereinigte Glanzstoff-Fabriken, both of Germany, American Bemberg Corp., with a plant at Jackson City, Tenn., was organized to produce cuprammonium yarn.

American Glanzstoff Corp. (now North American Rayon Corp.) began plans in 1927 for a viscose plant at Elizabethton, Tenn. In 1928, a subsidiary of La Soie de Chatillon, Italy, the American Chatillon Corp. (since merged with Tubize) erected a unit at Rome, Ga., for the manufacture of both viscose and acetate. Also organized in that year was a branch of the Dutch Enka Co., the American Enka Corp., with a viscose plant at Asheville, N. C. In 1930, Tennessee-Eastman Corp. began production of acetate yarn at Kingsport, Tenn. Other companies which have entered the rayon-producing field last decade are Acme Rayon Corp., Amoskeag Mfg. Co., Belamose Corp., Delaware Rayon Co., Furness Corp., Hampton Co., New Bedford Rayon Co., Skenandoa Rayon Corp., and Woonsocket Rayon Co. In addition to the building of additional units by several of these original companies, one further development which should be mentioned is the establishment of acetate plants by Viscose Co. in 1928 and by Du Pont in 1929.

This year the domestic production of rayon is expected to be approximately 200,000,000 lb., while total world output is estimated at 750,000,000 lb.

Coincident with the growth of the rayon industry have been the progress in manufacturing technic and improvement in the properties of the yarn itself. Today cuprammonium yarn is 200% stronger than the early foreign product. In the last decade alone the dry strength of viscose has been increased 30 to 50%; the wet strength, 80 to 90%. Until 1915, 150-denier yarn was the finest which was being produced successfully in this country. Now viscose of 50 denier, acetate of 45 denier, and cuprammonium of 15 denier are available. About 1926 began a decided trend toward the manufacture of so-called multifilament yarns; and whereas viscose, for example, formerly contained not more than 20 filaments, the same size is available at present with 90 filaments.

Better raw materials and more accurate control of manufacturing operations have resulted in greater uniformity in the physical, chemical, and dyeing properties of rayon, and have enabled the production of inferior qualities to be reduced to less than 1% in many deniers. The appearance of rayon has been greatly improved in the last 7 or 8 years by the perfection of methods for producing low-luster yarn. Introduction of the 30,000-yd. skein in place of the 10,000-yd. skein formerly available, the putting-up of yarn in package forms desired by the customer, and the introduction of pre-treated throwing cones particularly suitable for making crepe twists are among the most recent developments.

Rayon producers have made notable progress not only in improving the various types of yarn, but also in lowering production costs. This has been done by speeding up the spinning process; securing better recovery of caustic, solvents, and other chemicals; and developing quicker and more efficient methods of aftertreatment. In manufacture of viscose yarn, for example, pot-spinning speeds averaged 5,000 to 6,000 r.p.m. in 1924, while last year a speed of 15,000 r.p.m. was reported; in the same period spool-spinning speeds have been increased from between 40 and 50 meters per minute to over 100 meters per minute. The Furness process for cuprammonium, which was developed to the commercial stage in 1931, compresses spinning, aftertreatment, drying, twisting, and packaging into one continuous operation, which requires only about 3 min. to carry the yarn from the spinneret to the package.

Lower production costs are reflected in the lower prices charged for rayon. Thus in November, 1911, first-quality, 150-denier rayon was listed at $1.85 a lb.; after reaching a high of $6 during the war, the price has declined almost steadily to $0.55 last month. In 1925, when acetate yarn was first produced in this country, the 150-denier size was listed at $2.90; last month, at $0.65.

Finally, should be mentioned that the difficulties encountered by those textile mills which pioneered in the use of rayon have been almost entirely overcome; and today the properly equipped plant experiences little more trouble with rayon than with other yarns. This mastery of rayon in practically every branch of the industry has called for the adaptation of methods and machinery intended originally for handling other fibers. In addition, it has been necessary in many instances to evolve entirely new procedures and equipment. That progress has been so rapid and that rayon is now employed so extensively in a vast range of knitted and woven fabrics are due largely to the close cooperation between the yarn producer, the mill man, the machinery builder, and the manufacturer of dyestuffs and chemicals.

United Textile Workers vs. Textile Workers

WE witnessed parts of a tragic and futile struggle last week. The opponents were—and still are at this writing—the United Textile Workers of America and the textile workers of America.

That is not a smart phrase. It is a true reportorial statement.

Take Greenville as a case in point. The great majority of workers in that city had early signified their desire to remain at their jobs. We stood at the gates of several of the mills there as the shifts changed. Between lines of National Guardsmen, the employees filed out and in. They were greeted by catcalls and exhortations from a few pickets, and by a dead silence from hundreds of other workers and townsmen. It was the most tragic demonstration of futility this observer has ever witnessed.

And then there is the "Flying Squadron": an innovation in industrial warfare. Its principal significance rests in the fact that, with sufficient numbers of automobiles and men, the strike leaders can force practically 100% shut-downs without any regard to the validity of the issues involved, or to the willingness or unwillingness of the workers to participate.

Roaring through the country-side, these motorcades can effect strike compliance by any one of three methods. They can pull the main mill-switch and thus force closure. They can scare the workers so that the latter walk out in self-defense. They can influence the mill management to avoid possible bloodshed by closing the mill. All these methods have been used, and one or another of them is usually effective in each case.

But even at those mills which the "Flying Squadron" has not visited, the force of a small minority is felt. As a typical example, there is one mill which employs more than 1,500 workers, of whom not more than 50 are union members. Those fifty played on two human weaknesses: the fear of ridicule and the fear of bodily harm. Over the Labor Day week-end, they visited practically every home, and threatened all sorts of casualties to those who did not heed the strike call, and to the members of their families. When the mills opened after Labor Day, this minority formed lines and jeered those who entered or left the plant. As a result, the workers, and particularly the women members of the families, acquired a bad case of nerves. The mill management, sensing this, decided to shut down rather than to expose the employees to either fancied or actual harm. Thus, the union added over 1,500 to its published list of "strikers," even though practically none of that number had any desire to participate.

Multiply that incident many times, and you get a rough idea of the effects of the reign of terror set up by the U. T. W. You also get an understanding of the heading used on this editorial. The U. T. W. is *not* fighting the manufacturers. It is fighting the very people whose interests it is supposed to serve: the workers. It is forcing them out of employment in order to further its own ends.

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To understand how such an apparently silly situation can come to pass, it is necessary

to have a clear conception of the issues involved.

The sole issue in the strike is whether or not the U. T. W. shall be recognized as the official spokesman for textile labor. All other so-called issues advanced by the union are just so much eye-wash.

This is not a struggle on the part of employees to improve their working conditions, but an effort on the part of a labor organization to consolidate the gains it has made under the NRA. And we say this as an ardent supporter of the psychology of the NRA.

Prior to the passage of the act, the U. T. W. represented only a negligible number of employees in the industry. As a result of the impetus given to all unionism by the act, its membership increased until it had on its rolls probably between 15 and 25% of the total number of textile workers. (Exact figures are not available, but this is a fair approximation.)

This union now seeks to impose its will upon the other 75%, and also upon the thousands of textile manufacturers whose employees are either non-unionized, or only fractionally so. Obviously that is not a question of equitable employee representation, but merely a matter of self-interest on the part of an organization.

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How about the other demands—those for shorter hours, increased wages, and reduced use of the "stretch-out"?

Since NRA, hours per week in the cotton division of this industry have been reduced from an average of 55 to a maximum of 40; wage-rates have been increased approximately 75%, and an impartial body has been functioning as arbitrator in matters connected with the "stretch-out" and other employer-employee relations problems.

A study by the research division of NRA brought the conclusion that "there is no factual or statistical basis for any general increase in Cotton Textile Code wage rates." More significant still, the same agency discovered that manufacturing operations on representative cotton fabrics were resulting in a cash *loss* of 2½c. per lb.

It is true that there has been a sharp drop in the demand for textiles, and that employees have been working fewer hours per week, with resulting decrease in weekly wages. Just how a strike can remedy that situation is difficult to understand. One of the demands is for a shorter work-week but with the present weekly wage. This means higher costs in the industry, of course. And yet the NRA research division concluded that "increased costs (in cotton textiles) cannot be passed along to the consumer except at cost of lessened demand and fewer opportunities for employment," and that a "further increase in costs cannot readily be absorbed by the industry, for apparently even present costs have to be met to some extent by dissipation of working capital."

The other demands, pertaining to the "stretch-out" and collective bargaining, reflect a tendency to ignore the existence of the Textile National Industrial Relations Board. This Board, whose function it is to act in all disputes involving these and other matters, provides equal representation for employers and employees, is regarded as a model type of organization for this purpose, and has done a fine job to date. Such a Board, of course, can never get 100% commendation in this controversial zone, but impartial observers have recognized in it a long step forward in our national labor policy. To flout it at this time is a step backward.

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The method of calling the strike was as wrong as its origin. It was good stage-management, we admit, but bad ethics.

Each morning, for several mornings, Vice-President Gorman produced a strike in another branch of the industry for the newspaper headlines. Each morning, he drew a few hundred thousand more workers out of his vest-pocket, and announced their addition to the ranks of the strikers, until the impressive total of a million was reached.

Smart as this strategy seemed to be, it lacked spontaneity. Mr. Gorman might

have paused occasionally to give the appearance of considering somewhat the merits of each case. But, no, in rapid-fire order each group was stacked along with the rest. There is such a thing as too good acting.

Meanwhile, Mr. Gorman's so-called chief, Thomas McMahon, president of the U. T. W., was playing his little role up in Providence. "We have a friend in the White House," he declared in a Labor Day address. A little later in the same speech, he said: "I have no fight with constituted authority, but I know that President Roosevelt would rather see mill workers fight for the justice he demands for all labor." Later, when asked if this meant the President was in back of the strike, Mr. McMahon performed one of the somersaults for which he became famous at the code hearings in Washington. "I did not say that," he replied. "The President . . . . . wanted naturally the calling off of the strike. His humanity was uppermost." That is what is called "creating an impression"—even though it is necessary to follow up with a denial.

We ourself heard many union agitators in the South play this same chord. "Come over on this side," they would shout; "the President is with us—help him out."

The pathetic part about this, so far as the actual start of the strike is concerned, is that the U. T. W. never had the slightest intention of compromising with anybody, from the President down. The union had decided a strike was necessary in order to establish its position as the official representative of the textile employees—and the strike was to go on, no matter what happened. "We confidently expect the strike to materialize," said Mr. Gorman in advance—and he expressed the union's feelings aptly.

The union's later proposal for arbitration was equally insincere. The basis of 100% shut-down as a setting is too amazing to warrant serious discussion. The U. T. W. was not seeking arbitration; it was demanding that Governor Winant's board accept the union's demands as the terms of settlement.

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Such is the story of the textile strike.

In its wake have come bloodshed and bewilderment. The average worker, and the average citizen, have been left stunned, wondering what it is all about.

The union, of course, is talking a lot about the use of troops. It was the use of the "flying squadron" that necessitated the use of troops. Never, in our experience, has the latter been more justified. It was a last resort against a type of warfare that ignored all rights of the individual and of the community. The U. T. W. itself has levied bloodshed as the greatest cost of its struggle for domination.

It has never been possible for the manufacturers to deal en masse with the U. T. W. It did not represent anything approaching a majority of the workers. It did not initiate the strike sincerely. It did not observe the most elemental rules of decency in warfare. It is an outlaw union in every sense of the term—even though it does belong to the A. F. of L.

Under these circumstances, we urge manufacturers to hold the fort. They are fighting for the autonomy of their workers. Much as we would like to see this monstrosity of a strike stopped, we know that its termination through concessions on the part of the manufacturers would be fatal to the future of the industry and its workers.

This is going to be a constantly recurring source of conflict. The U. T. W. has nothing to lose and everything to gain. It will launch attack after attack, no matter what the textile workers themselves may lose thereby. It is necessary, therefore, to resist each attack as it comes.

Otherwise, the United Textile Workers of America will defeat the textile workers of America.

Douglas G. Woolf

Editor, TEXTILE WORLD

Textile "Strike"

AS SEEN BY "TEXTILE WORLD'S" EDITORS IN MAJOR MANUFACTURING CENTERS

"THIS is not a strike." These words sum up the gist of conversations with scores of textile manufacturers during the first week of the drive staged by the United Textile Workers of America.

The industry has been searching for a name for this type of industrial warfare involving the use of the "flying squadron." Both mill-men and non-partisan observers have referred to it as anarchy, rebellion, chaos.

Whatever it is, it has plunged a great industry into misery. It has arrested the progress of recovery which had started in this industry before any other, and which had gone further. It has brought death and suffering.

As we write this, the end is not in sight. The Textile Mediation Board is still striving to reach some basis for arbitration. Important developments may take place before this issue reaches readers.

Below are first-hand accounts, by members of the editorial staff of TEXTILE WORLD, of "strike" conditions in the major textile sections.

The Southern Sector

As was to be expected, the cotton division has been the principal arena. Also as was to be expected, the major push was further localized to the southern branch of that division. It was recognized that the outcome in that section would practically determine the outcome nationally.

As we started South at the beginning of the first week, we made it a point to investigate the numbers at work and idle in the different towns. It soon became evident to us, however, that such estimates were meaningless. It was a question of how far the "flying squadron" method of warfare was to be permitted to go. If it was allowed to go to the extreme of crippling 100% of the industry—without regard to the issues involved—the strike leaders could offer that result to the Government as proof that the U.T.W. represents textile employees 100% strong.

However, the use of troops—forced upon the reluctant Governors of the two Carolinas — checked this drive after it had passed somewhat beyond the 50% mark. In addition, public reaction against the reign of terror initiated by the "flying squadrons" set in. The belief gained ground that, having swiftly reached a climax, the "strike" would peter out just as quickly. Against that optimism was a realization that the U. T. W. had staked its all on this drive, and that it would carry on in the face of bloodshed, and in the face of resistance on the part of the great body of textile employees.

International

George A. Sloan, who as president of the Cotton-Textile Institute has been active in presenting the manufacturers' side

As plants started to reopen at the latter part of the first week, it was evident that the union had lost ground. It was predicted that, by the end of the second week, 75% of the southern spindles would be active. However the section had still an appearance of a wide-flung battle-field; it was apparent that nothing had been settled while such conditions prevailed.

The toll of life during the first week was ten. This tragic fact had a sobering effect upon the entire section. What had started out as a wild, high-adventure drive became a dragging, halting affair. The "flying squadrons" did not soar very high, after the realization gained ground that this new type of warfare had been responsible for ten lives.

We have discussed the significance of these squadrons in the editorial which precedes this account. A first-hand description of their methods may be of interest. The following, written by a member of our staff at Greenville, S. C., was not designed for publication—which possibly makes it all the more publishable:

"The 'Flying Squadron' of union people came down Main Street, headed south, today between 11.30 and noon. There were three truck-loads of unionists, about 90% of them boys in their teens, and I judge some four or five hundred automobile loads in addition to the three truck loads. The 'Flying Squadron' was led by a car carrying a big United States flag. Picker sticks were prominently displayed by the boys in the three trucks, and I also noticed some sticks in the hands of the men in the cars. The leader of the parade paid no attention to the traffic lights; however, the cars in the tail end of the parade did stop for red lights.

"I rode around the Mill Belt immediately after lunch and found everything quiet with soldiers on guard until I got to Judson, where there had been considerable rioting and fighting between the 'Flying Squadron' from Spartanburg and non-union operatives. Judson was apparently closed down, and the mob of unionists was leaving just as I arrived. The word was passed to go to Monaghan from Judson, but one truck-load of what appeared to be shock troops of the union yelled that they were going to Woodside. I reached Woodside just as they arrived at the main entrance. The captain of the company on guard at Woodside drew his revolver and so did his two lieutenants. He ordered his men to hold their bayonets at the charge, and this little show of force dispersed a portion of the mob at Woodside. As the mob was leaving, the captain of the company on guard deployed one-half of the company to the side entrance and stood in front of his men with a revolver in hand.

"As the mob was leaving Woodside without any attempt to enter the mill, which, as you know, has no wire fence around it, there was considerable yelling of 'back to Brandon,' but the next stop was at Monaghan around 3.15 or 3.30. Apparently all of the Spartanburg 'Flying Squadron' assembled there, and I counted four truck-loads of unionist shock troops. The unionists raised two United States flags at the main gate at Monaghan and gathered around in considerable numbers. The day shift left Monaghan at four o'clock, but I learned that the mill had instructed its night shift to report for duty not later than 3 p.m. As a consequence, the night shift was already inside the mill when the mob arrived—and apparently the mill was operating all its machinery. The mob was puzzled—due to the failure of the night shift to try to enter the mill—and apparently there was much confusion.

"There was a company of militia on guard at Monaghan when I reached there and, while I was waiting to see what happened, a second company arrived and was quartered on the platform of the Monaghan cotton warehouse. I was told by the first

lieutenant of the company that they were following the mob from mill to mill to reinforce the company's own guard. There was no evidence of any violence at Monaghan up to the time I left there at 4.30 this afternoon, and as stated before, the night shift reported earlier and the mill appeared to be in operation.

"As for the Spartanburg 'Flying Squadron'—I have been in a lot of crowds in my time, but I never saw a worse looking set of individuals in my life. My classification of them is just 100% tough and worthless—most of them young hoodlums."

On the New England Front

Impressions gained by a representative of TEXTILE WORLD in a trip through the affected area in Southern Massachusetts, Rhode Island, and Connecticut are summarized briefly below: Comparatively few of the textile operatives are actively supporting or are in favor of the strike. In fact, many of the workers do not know what it is about.

Probably not more than 10% or 15% of the operatives in Fall River are members of the U. T. W. although the union claims a much larger percentage. New Bedford is more strongly unionized. In Fall River, at the Pepperell plant only 20 out of 750 employees went out voluntarily; at the Charlton Mills 100% of the employees reported for work on Tuesday; at the Bourne Mills, in one shift of over 500 operatives, only between 20 and 30 went out the first day; less than 10% of the employees of the cotton mills division of the American Printing Co. failed to report the first day of the strike.

With an overwhelming majority of the operatives desiring to work, and public opinion largely against the strike, cotton manufacturers in Southern Massachusetts—and particularly Fall River—believe that the strike will be of short duration. Manufacturers are somewhat critical of State and municipal authorities for failure to afford adequate protection against intimidation of workers and threats of violence against mill property, and would be inclined to reopen mills if given assurance that property protection would be afforded.

In view of the fact that no demands have been made of any individual mill, owners are perplexed as to how to cope with the situation and are inclined to wait for developments from "higher up"; that is, action by the President's mediation board in the national situation or by State authorities in the local situations. Union leaders in one breath disavow any responsibility for violence at mills and intimidation of workers; and in the next breath exhort strikers, "If hit, hit back; if shot at, shoot back."

The one small bit of humor in the grim situation was the way in which a detail of police followed Anne Burlak, prevented her from holding a meeting in Fall River to tell how a strike should be conducted, and finally escorted her to the State line. For a few hours "The Flame" stole the show, the police apparently regarding her as a greater menace than all the union pickets, and U. T. W. officials terrified that their strike might become associated in the mind of the public with the activities of this tantalizing young communist agitator.

International

Textile Strike Mediation Board appointed by Pres. Roosevelt as it convened for first time. Left to right: Marion Smith, Atlanta, Ga.; Gov. John C. Winant (chairman) of New Hampshire; Raymond V. Ingersoll of Brooklyn, N. Y.

Middle Atlantic States

The silk and rayon weaving divisions and the silk throwsters branch of the textile industry entered the second week of September in a badly crippled state, as result of the general strike. While the air was full of rumors of possible piece-meal settlements, specific evidence pointed to the contrary. Even as the jacquard fabric manufacturers of New Jersey were pressing Francis J. Gorman, chairman of the general strike committee at Washington, to approve their union contract which provides for a higher-than-average wage scale, the general strike spread to the hosiery division, with the announcement by the American Federation of Full-Fashioned Hosiery Workers, Philadelphia, that a walkout had been ordered for Sept. 12 in all hosiery mills not having contracts with the union.

Claims as to the effectiveness of the silk-rayon weavers' strike varied from 25 to 40% as conceded by manufacturers' spokesmen to 90% as contended by certain officers of the American Federation of Silk Workers. While no exact figures were available, it was evident at the start of the strike's second week that fabric production in all the chief silk districts, New Jersey, Pennsylvania, New York and New England, had been drastically curtailed.

In the New Jersey area, manufacturers conceded the strike to be nearly 100% effective. The chief issue in that district was the sanctity of contract, and this is already before the courts through application of manufacturers for an injunction to compel the local unions to fulfil their contract terms, which, it was claimed, had been violated by the

Acme

A "Flying Squadron" from Spartanburg County, getting under way near Greer, S. C., after a display of force at the Apalache plant of Victor-Monaghan Co., Arlington, S. C. Note motor trucks on left for those who had no cars. This is the same motorcade as described in the text.

International

Picketing with clubs—view from mill window at La Grange, Ga.

strike. It was intimated that damage actions, similar to those instituted in the historic Danbury Hat Co. case, might follow unless the strike were speedily terminated.

Paralleling this was the situation in the New Jersey dyeing and finishing industry where a strike was in prospect despite that fact that both workers and companies are bound by contract which does not expire until Oct. 24. A list of demands, including one for a 30-hour week was served on the Institute of Dyers and Printers and other N. J. organizations, Sept. 10, by the general strike committee; it was decided that, if these demands were rejected, a strike would be called for Sept. 17.

Meanwhile, market demand for silk-rayon textiles was strengthening, and the finishing division reported a decided pick-up. In the New Jersey district alone the strike, up to Sept. 10, had eliminated nearly 2,000,000 yd., based on a daily output of 400,000 yd.; manufacturers and workers each had lost $250,000, in business and wages, it was estimated. New Jersey workers made idle by the strike totalled 12,000 which would be raised to 27,500 by a walk-out of dyers and finishers.

One of the significant outgrowths of the strike has been a strong sentiment in the silk-rayon weaving, throwing and finishing divisions, favorable to the consolidation of all branches, including cotton and wool, in a general textile code. In the New Jersey district, textile leaders were virtually unanimous in urging such action, asserting that conflicting wage provisions in codes were a major underlying cause of the strike.

"Strike" Notes

ON OUR return from a trip through the strike centers of the South, we felt remorseful that we had spent the firm's money. All one has to do is to buy a newspaper and read

International

Heads of United Textile Workers—Left to right: Wm. F. Kelly of Philadelphia, 2nd vice-president; Thos. F. MacMahon of Providence, president; Francis J. Gorman of Washington, 1st vice-president and chairman of strike committee.

Secretary of Labor Perkins' n'th-hand account of doings there. "As to the 'flying squadrons'," reports the New York *Times*, "the Secretary said that this method of strike operation was not an entirely new thing. It was possible, she felt, that some of the groups were hoodlums. 'Mr. Gorman assured me that no hoodlums would be tolerated by the union,' she added." Such sublime faith is touching. However, more useful would be the personal expenditure, by the Secretary, of a few dollars of Government travel money in order that she might have something other than Mr. Gorman's "assurances" to discuss with newspapermen.

●

We sympathize with the U. T. W. in its unsuccessful attempt to make this strike its own private party. It must be rather exasperating to see both the Communists and Socialists steal front-page space in somebody else's row. For the former, Anne Burlak, erst-while perennial code-hearing orator, "muscled in." For the Socialists, no less a person than Norman Thomas, frequent nominee for President of United States, tried to catch a beam of the spot-light by announcing his willingness to go to South Carolina and speak at the funeral services for the strikers killed at Honea Path. Evidently there was no public clamor for Mr. Thomas' appearance, as James Myers, of the Federal Council of Churches, made the address. But, anyway, Mr. Thomas and Anne both acquired printer's ink which properly belonged to the U. T. W. exclusively. There should be a way to copyright these strikes.

●

Those residents of the Piedmont who crave excitement were distressed to witness the taming-down of the "flying squadrons"

International

Picketing with signs—scene at Olneyville, R. I.

toward the end of the first week of the strike. From rip-snorting caravans of righteous wrath they degenerated into third-rate circus parades. As we passed through Shelby Friday of that week, we learned that, after visiting one little old yarn mill, they were not ferocious enough to picket it even though the management refused to close down. As a result, unkind remarks were passed around, such as: "Probably the squadron has gone on a picnic now," or "No, it has just stopped for afternoon tea." It's pretty hard to remain valorous in the face of such ridicule.

●

As we understand it, there is not enough business to keep textile mills busy for two 40-hour shifts a week, so the U. T. W. decides to "strike" for two 30-hour shifts. The fact that excessive increase in costs helped cause business to dry up, is met by this plan to boost costs still more. This resembles castor oil more than economics. However, if the industry is hardy enough to live through it, it will be able to stand anything.

●

We see by the papers that Norman Thomas "accused the Cotton Textile Code Authority of having created a $1 differential between the North and the South to cause sectional strife among the textile workers." In view of the facts in the case, well known to all textile manufacturers, this statement would be funny if it weren't sad to see a man make a public display of either ignorance or untruthfulness. It's one or the other.

The Editor Says:

WE HAVE now reached an acute stage of the phase of the recovery movement which we predicted in these columns last November. We anticipated at that time that before the legal life of NRA came to an end, the individualist would be back in the saddle: "not the representative of the type of individualism which we hope will always be preserved in this country," we pointed out, "but the rugged individual who can see nothing in all this 'bunk' about cooperative effort."

Just that has come to pass. All but the most ardent supporters of NRA have deserted its cause; the latter are but voices crying in the wilderness.

Just why has this happened so precipitately?

One of the main causes has been the battle over the labor implications of the movement. Industry accepted, grudgingly it is true, clause 7A in return for assurance of certain privileges of its own. Increasingly bitter industrial strife has convinced the rank and file of manufacturers that they made a bad deal.

In the textile industry, it is not necessary to discuss this situation theoretically. We have an actual battle on our hands which can be cited specifically. Naturally, the so-called "Tories" do not hesitate in adopting an attitude toward the present strike. But that is only part of the story. The basis on which this strike has been engineered by the United Textile Workers arouses the "Tory" in even the most liberal of the manufacturers. This writer is frank to admit that he can see no justification for the present conflict—and he is convinced he is correct in this attitude.

All right, but what then?

Granted that this strike is absolutely wrong, and must be beaten, what is to be our attitude after that end is reached? Are we to lose all the good that there has been in our purposeful approach toward self-government, or are we to resume our places in an effort that is bigger than any industry or any labor union?

The textile industry's answer to that question will determine its fitness or unfitness to govern itself.

❖

And What Comes Next?

THIS raises the question: What is the outlook in the recovery movement as a whole, without specific reference to textiles?

As we see it, an approximate end has been reached to the possibilities of further re-employment by purely artificial means. By that we mean that the initial results of NRA, AAA, etc., have been spent, and that little can be achieved through further codification. There is still, of course, the purely relief enterprise, which can—and must—continue to avert suffering and to give employment through public expenditure. But no one can regard this as a permanent solution.

On the other hand, we believe that the natural processes of recovery have just begun to make themselves felt. This may seem to be a strange statement under immediately present conditions, but we sense it to be a true one. It is our belief that the country as a whole is now more or less convinced that recovery is on its way, and that the effects of this psychology will be demonstrated clearly this fall and next winter. To debate whether artificial means aided or hindered this natural recovery is now purely an academic pursuit. Personally, we believe it aided—and was in fact indispensable. Those on the other side are finding plenty of forums for the expression of their views.

As a support to natural recovery, however, there is needed the attitude which we indicated in the preceding item. It is necessary to segregate permanent from transient trends in the recovery program. The former must not be confused with what we have termed "artificial" means. It is not "artificial" to establish a base-line beyond which wage-chiselers may not go. It is not "artificial" for an industry to put its house in order so that the premium on good management may be restored. It is not "artificial" to set up machinery to insure the permanency of that restoration. All this is socially and economically sound: today, tomorrow, and for all time.

Consequently, an appraisal of the effects of the recovery program, in each branch of industry, is now called for: an appraisal similar to that contemplated by the Silk Textile Code Authority, which we discuss editorially in the Silk Digest of this issue. The good must be retained, and the bad rejected.

We are conscious that, in their present mood, many manufacturers will regard this suggestion as just so much more tripe. We are equally conscious that their point of view must and will change. We sympathize with them in the predicament in which they find themselves today. We know it is much easier for an editor to speculate in this manner than it is for a manufacturer who faces rising costs, insufficient returns, and an unjustified strike to boot. But that of course is the only reason editors exist. It is not that they are gifted with wisdom and vision beyond that possessed by their readers, but merely that they can sit on the side-lines, away from the heat of the battle, and retain an objective view-point.

And, anyway, the editor can always have the last word.

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Industrial Self-Government at Stake

WE KNOW nothing about conditions in the cotton garment industry. We do not know whether it needs a 40-hour week, a 36-hour week, or a 30-hour week. We do not know the inside story of why it was necessary to impose a 36-hour week upon it, by governmental fiat. Nor do we know how much opportunity was given that industry to put its own house in order, if such house-cleaning was necessary.

But we do know that the public implications of this move by the NRA are serious. In the minds of many observers, a precedent has apparently been set which might lead to the most tyrannical governmental control.

Unfortunately, the general public confuses the apparel trades with the textile industry. There have been dire forecasts—and in these, textile manufacturers themselves have shared—of NRA imposition of the 36-hour week, with the 40-hour week wage-rate, upon this industry. Personally, we cannot believe that any such move will be made with respect to an industry that has done so much toward re-employment. Nevertheless, the fear persists—and will persist until the issue is clarified.

Toward that end, one of two steps seems essential. If the cotton garment industry, on the one hand, can make out a clear case of unjustifiable interference by Government, it should fight it out on those lines until

this threat is removed from all industry. If on the other hand, the NRA can prove definitely that its action was necessary in the interests of labor, the public, and competing trades, it should make sure that its reasons are understood thoroughly by the general public, and should also assure other industries that they are not in danger of such interference except as a last resort in the public interest.

Unfortunately, the latter case is difficult to prove. Enthusiastic as we still are over the psychology of the recovery program, we have never endorsed, nor do we now endorse, the idea of a bureaucratic arbiter of industrial problems. That is not what was contemplated in the setting up of industrial self-government. The majority will of each industry was intended to prevail, and governmental aid was to be invoked merely to enforce the wishes of that majority. The NRA must make out a bullet-proof case. It must establish either that a minority had gained control, or that in this particular instance the majority will was clearly subversive to the public interest.

Otherwise, the fundamental intent of the recovery program will have been obscured.

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Says Who?

"REMOVE Restrictions and Regain Trade!" That is the heading over an editorial in a contemporary publication. It is typical of much of the thinking just now. The idea is that, if we will only get away from these fool NRA notions, and let manufacturers do what they please, everything will be all right, and we'll build up a tremendous export trade, because we have the most wonderful machinery in the world, and so forth, and so on.

Well, we've been trying this unrestrained stuff for the last several years—and look at the volume of our trade—both domestic and foreign!

Think also of the conditions under which employers and employees have struggled! Pretty high price to pay for freedom from restrictions!

"Remove Restrictions and Regain Trade!"

Says who?

❖

Encore

THE above is the same sort of hooey as is all the talk about survival of the fittest. The anti-NRA crowd is now insisting that production control keeps inefficient units alive—and that all we need to do is to take down the barriers and soon the strong efficient units would survive and the weak ones would disappear.

We have been observing the textile scene, in an editorial capacity, for a long time and we haven't seen that "law" work out yet. Even if some of the weak sisters do die off—as they do, of course—some bright boy comes along who hasn't even heard of the law of survival of the fittest, buys the machinery from the estates of the deceased, starts it up and adds that much worse type of competition to an already disorganized market.

Theoretically, we don't like production control any more than the next one does. We think it would be fine if a man could operate his business just as he felt like. It would be fine, too, if we could run a car any way we chose and park it where we wished. But, says the ardent individualist, one endangers the innocent bystander, and the other doesn't.

Oh it doesn't, eh?

Our vocabulary must be thinning out. The only appropriate comment seems to be another "Says who?"

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NRA Applies "Institute" Idea

THE NRA has put into practice the principle we had in mind when we suggested, some months ago, the creation of an American Textile Institute, representative of all branches and consolidating the medley of trade associations which are now serving this field. NRA has grouped all the textile and apparel codes into one division, to be administered by one division administrator with a staff of deputies. In fact it has gone us one better because naturally we did not have in mind the inclusion of the apparel groups in the textile industry proper.

The new Textile Industries Division of NRA is an imposing thing. It represents 111 separate industry units having 2,500,000 employees, $6,818,000,000 invested capital, and an annual volume of business of $8,970,000,000.

NRA believes that "grouping of industry units is expected to bring closer harmony and effect amalgamation of codes; some of the smaller codes owe their existence merely to industry rivalries or personal ambitions."

That statement goes for our idea of an American Textile Institute, too. We hope that at least the compromise suggestion—the organization of a national council made up of representatives of existing associations—will be taken up seriously as a half-step in the right direction.

Incidentally, we should think such a council, if it were in existence, would come in sort of handy just now as a medium through which the industry could express to its workers and to the general public its side of the current unpleasantness with the U.T.W.

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The Greenville Show

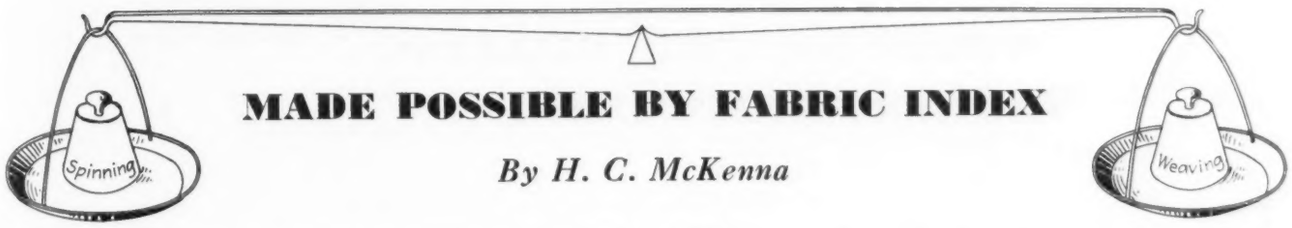
A MONTH from now, Greenville, S. C., will again be playing the feverish rôle of host to the textile industry. The Southern Textile Exposition will be held there Oct. 15 to 20. Judging from past performances, the city may be counted on to play its rôle well.

The exposition offers an opportunity to southern manufacturers and their mill executives to see in operation the latest types of equipment, and to become familiar with the most recent developments in accessories and supplies.

W. G. Sirrine, managing director, is correct when he points out that code restrictions on purchase of new equipment do not limit interest in the displays at this show. On the contrary, there is an added incentive for the replacement of worn-out and obsolete machinery, for the "balancing" of existing equipment, and for the utilization of the most efficient and economical types of supplies which science can develop.

No southern manufacturer can afford to neglect this opportunity for himself and his staff.

Balanced Production



MADE POSSIBLE BY FABRIC INDEX

By H. C. McKenna

ONE of the many problems of novelty cotton-goods mills which has been accentuated by the present definite limitations as to the hours per week which spinning equipment may operate is that of balancing the weave-room production with the spinning production. To assist in the solution of this problem the "Fabric Index" was devised.

The Fabric Index for each fabric is the figure which shows the percentage of spinning capacity required to supply the total weave-room yarn requirements if every loom in the mill were devoted solely to weaving the particular fabric in question. For example, if the Fabric Index of a 32-in., 5.5-yd. gingham is 0.833, and if every loom were put on this fabric, the yarn requirements would be 83.3% of the total spinning capacity. In other words, the total weaving requirements would be 83.3% of the total spinning capacity.

Each mill, of course, will have to find the Fabric Index of each fabric it manufactures, taking into consideration such factors as number of spinning frames, number of looms, production per frame, production per loom, etc. However, let us assume that Mill A has 400 looms and 60 spinning frames, and that the production per frame for 80 hours is as follows:

Count	Lb. of warp per frame	Count	Lb. of filling per frame
15	970	15	975
30	396	30	485
40	280	40	333

Furthermore, assume that the 5.5-yd. gingham has 30s warp and filling, and is 55% warp and 45% filling. Also assume that the weaving production on this fabric is 284 yd., or 51.64 lb., per loom per week of 80 hours. Then, if Mill A puts its 400 looms on this fabric, the total yarn requirements would be 20,656 lb., or 11,361 lb. of warp and 9,295 lb. of filling. In this case, the Fabric Index for the gingham would be found as shown below.

11,361 × 1.03 (warp waste) ÷ 396 = 30 warp frames.
9,295 × 1.04 (filling waste) ÷ 485 = 20 filling frames.
As mill A has 60 spinning frames, and only 50 are required, 50 ÷ 60 = 0.833, which is the Fabric Index.

In the case of a fabric containing several yarns, each yarn will have to be handled separately. For instance, assume that Mill A is weaving a 36-in., 3.6-yd. seersucker. The goods have 15s yarn in the crinkle, 30s warp in the ground, and 30s filling. The pounds per loom per week are 74.4; and on a 400-loom basis, 29,760. The goods have 50% 15s warp, 19% 30s warp, and 31% 30s filling. The Fabric Index would be figured as shown below.

14,880 × 1.03 (warp waste) ÷ 970 = 16 warp frames.
5,654 × 1.03 (warp waste) ÷ 396 = 15 warp frames.
9,226 × 1.04 (filling waste) ÷ 485 = 20 filling frames.
With a total of 51 frames required, 51 ÷ 60 = 0.85, which is the Fabric Index.

Use of the Fabric Index is not intended to replace the usual mill production budgets; yarn, frame, and spindle estimates; etc. Rather, it is a fast method by which the selling agent or mill management may ascertain if, with a given loom assignment, the mill will be in balance, and, if not, how far out of balance either way it will be.

Since the Fabric Index for each fabric is found when the piece of goods is designed and the cost card figured, the selling agent or mill manager has but to multiply the number of looms assigned to each fabric by its Fabric Index and divide the sum of these products by the total looms. He thus obtains the percentage of spinning capacity required to supply his looms.

Let us assume that Mill A to take care of orders assigns its looms as follows:

140 looms on 32-in. gingham with a Fabric Index of 0.833
100 looms on 34-in. handkerchief with a Fabric Index of 0.86
60 looms on 36-in. seersucker with a Fabric Index of 1.18
100 looms on 36-in. shirting with a Fabric Index of 1.25

The method of using the Fabric Index in this case is as follows:

140 × 0.833 =	116.6
100 × 0.86 =	86.0
60 × 1.18 =	70.8
100 × 1.25 =	125.0
400	398.4

398.4 ÷ 400 = 0.996. That is, 99.6% of the spinning capacity is required to supply the weave room with sufficient yarn.

The same loom assignment worked out in detail is shown below. This is done merely to indicate how the usual frame assignment checks with the Fabric Index. Of course, in actual practice where parts of a frame show, a frame would be switched from one count to another at intervals to take care of the weaving requirements.

Looms	Fabric	Yd.	Lb. Warp	Lb. Filling
140	32-in. Gingham	39,760	3976 (30s)	3253 (30s)
100	34-in. Handkerchief	28,400	2840 (30s)	1740 (40s)
60	36-in. Seersucker	16,080	2954 (30s)	1390 (30s)
100	36-in. Shirting	25,000	1170 (30s)	2106 (40s)
			2574 (40s)	

30s warp 10,940 lb. × 1.03 = 11,268 ÷ 396 = 28.4 frames
40s warp 2,574 lb. × 1.03 = 2,651 ÷ 280 = 9.4 frames
30s filling 4,643 lb. × 1.04 = 4,829 ÷ 485 = 10.0 frames
40s filling 3,846 lb. × 1.04 = 4,000 ÷ 333 = 12.0 frames
With a total of 59.8 frames required, 59.8 ÷ 60 = 0.996, or 99.6% of the total spinning capacity.

Should the total Fabric Index for any loom assignment work out in such a manner that the mill is out of balance, the management can do several things to the loom assignment that will put the mill in balance. First, it can reduce the number of looms with an unfavorable Fabric Index and increase the number of looms with a favorable Fabric Index. Second, it can substitute for one of the fabrics a fabric with a better Fabric Index. Third, it can revise the construction of a fabric so that it has a more favorable Fabric Index. This is illustrated by the seersucker with all 30s yarn with a Fabric Index of 1.18 and the same seersucker, but with one end of 15s replacing 2 ends of 30s in the crinkle, with a Fabric Index of 0.85.

After the Patent

WHERE DOES THE RINGLESS-HOSIERY STORY LEAD?

THE demand for copies of the so-called ringless-hosiery patent (No. 1,969,307) issued to Charles A. Kaufman on Aug. 7 was so great that the Patent Office's supply was exhausted almost immediately. Those who were fortunate enough to beg, borrow, or steal a copy soon discovered the following facts: The patent covers both the hosiery and the method of manufacture, but does not specify, and hence is not confined to, any particular mechanism for operating the carriers. It does not confine itself to three carriers, merely specifying the laying of "at least three separate yarns of natural silk of substantially the same color and character and forming knitted loops therefrom in a series of successive courses wherein each course consists of a yarn of natural silk that is separate and distinct from the yarns of the other courses." It is, however, limited to hosiery—and even to full-fashioned hosiery. Therefore the anxiety which has been expressed as to the possibility that the patent would apply to the weaving of fabric with multi-shuttles is dispelled. Also, the patent is limited to the knitting of natural silk.

The man whose invention has thus been given recognition by the Patent Office has had a varied experience in the hosiery business. When, shortly after leaving college, Charles A. Kaufman established the Floradel Knitting Mills in New Orleans, around 1920, and began manufacturing women's seamless silk hosiery, he was probably the first manufacturer of silk hosiery in the South. He joined the organization of Julius Kayser & Co., Brooklyn, N. Y., as factory assistant, in 1928; and he is now assistant manager of that company's hosiery department.

The Textile Patents Corp., Fidelity-Philadelphia Bldg., Philadelphia, which controls the patent by prearrangement, was formed a few years ago primarily as a patent pool to control the ill-fated non-run hosiery. It comprises the following companies: Julius Kayser & Co., Berkshire Knitting Mills, Apex Hosiery Co., Mock Judson Voehringer Co., Oakbrook Hosiery Mills, Greensboro Full-Fashioned Hosiery Mills, Meinig Hosiery Co., and Walls Knitting Mills.

Manufacturers' reactions to the granting of the patent and to the proposed regulations of the patents corporation are varied and seem to depend to a considerable extent on whether the manufacturer interviewed is a member of the pool or an outsider. Members declare that the effect will be beneficial to the industry. License stipulations as to price will curb ruinous price-cutting, they insist, and the care exercised to maintain quality in multi-carrier hosiery will insure preservation of the consumer's respect for the new product.

It is to the manufacturer's interest to preserve the consumer's respect for two reasons: First, properly manufactured multi-carrier hosiery overcomes the growing resentment of the consumer against the rings so frequently encountered in the light-weight, high-styled hosiery of today. Second, multi-carrier hosiery means a saving to the mill by reducing the number of irregulars, this reduction amounting in some cases to more than 50%. The reduction depends not only on the elimination of rings or bands but also on the elimination of differences in shade between leg and foot, in so far as such differences are due to irregularities in the silk. A relatively new discovery is the fact that the multi-carrier method of knitting helps to maintain uniform hosiery lengths by minimizing the stitch-tightening effect of heavy silk and the loosening effect of light silk. The saving is only slightly counterbalanced by a decrease in production.

Opposition to the pool's original license terms crystallized Aug. 23 with the news that Roy E. Tilles, vice-president of Gotham Silk Hosiery Co., had become chairman of a committee representing outside manufacturers which is negotiating with the patents corporation. Members of the pool depreciate the likelihood of a validity contest, but a contrary sentiment manifests itself among firms not members of the pool. The latter raise various objections to the pool's proposals. For example, they claim that the proposed charge to non-pool manufacturers of 10c. per doz. for licenses, to be applied universally, will work hardship on numerous mills; the fee is too high, it is argued, as many firms do not have a profit of 10c. per doz. on ringless in present trading. Criticisms also have been made of the license form.

The major apprehension, however, centers on a clause in the agreement forbidding licensees to "question or contest" the patent's validity. Similarly, doubt is expressed as to whether the market can maintain the minimum selling prices, $6.35 to retail, $5.75 to jobber, as provided in the license.

Meanwhile, however, demand for ringless is good. Production approximates orders, permitting healthy movement. It is estimated that 30% of the full-fashioned industry has three-carrier equipment, and that of this 20% is in normal operation, the remainder being still in process of adjusting to the new method. The issuance of the patent tended to slow up orders, as buyers were doubtful of their own legal position in handling the output of mills not in the patent group. In the main, this slackening has been less than expected, as most mills solve the problem by guaranteeing customers against any possible legal action.

The market is hoping for settlement of the whole question in time for the late fall demand, which is expected to be the biggest since the advent of ringless. However, the issue is so involved and new set-backs are being experienced so constantly in the negotiations, that leaders on both sides are resigned to a period of delay. An idea of the magnitude of the financial aspect is conveyed in the estimate, wholly unofficial, that total royalties accruing to the members of the patent pool may reach $2,000,000 annually. One of the most obstinate problems facing the Textile Patents Corp. at the end of August, according to William R. Smith, vice-president of that corporation, was adjustment of the conflicting interests of branded-line mills on the one hand and non-branded manufacturers on the other.

When to Nap

IS MOOT QUESTION IN PROCESSING FLANNELETTES AND OTHER RAISED GOODS

By Ray Cottrell

ALTHOUGH the manufacture of cotton napped goods has never recovered fully from the severe setback received during the early post-war period, there is, nevertheless, a wide range of fabrics which require napping. Among these are included cotton blankets, flannelettes, shoe linings, doeskins, shirtings, polishing cloths, moleskins, and cropped velvets. Of the recent improvements in processing this type of material, the most interesting perhaps is a semi-mercerizing treatment which enables several of the preliminary operations to be carried out continuously. Before we consider this process, it will be advisable, however, to survey briefly the question of what sequence of operations will give the best results.

Considerable Variation in Practice

It should be noted, first, that for the same type of fabric practice varies considerably in different plants. In finishing doeskins, for example, opinion seems to be fairly evenly divided as to whether napping should be carried out before or after dyeing. It is generally considered that it is easier to nap a cotton fabric before bleaching, but that the nap is likely to be impaired in subsequent bleaching and dyeing operations. On the other hand, napping of bleached and dyed goods produces a shorter and finer nap with better cover and wearing properties. As a rule, the short-napped plain fabrics are napped before bleaching and dyeing; the longer-napped plain goods are napped after bleaching or are napped before bleaching and then given a final light napping after wet finishing. Printed fabrics usually are napped before printing, but generally require a light napping after printing. There are a few printed fabrics which are napped after printing, but only when a blurred or two-sided effect is required. The imitation wool flannel shown in Fig. 1 is an example.

Cotton blankets—whether natural, plain-dyed, or with colored borders—almost invariably are napped in the loom state. The latest tendency is to nap the highest quality cotton blankets on a 30-roller machine; rough blankets for export to the Orient on a 40-roller machine; and the average run of blankets, on a 36-roller machine. After napping, the highest quality blankets are generally passed through a combined steaming, brushing, lustering, and calendering machine. In order to obtain the full cover and smooth mossy finish required of the better class blankets (and long-napped fabrics in general) the newer napping machines are equipped with a felting action. This action is usually commenced after the goods have had two or three runs on each side and is, to all intents, simply a controlled tangling of the nap. Polishing cloths are usually napped on a 36-roller machine; shoe linings, casket cloths, etc., on a 24-roller machine.

Two factors which influence the processing of napped goods are the available yardage and whether or not the goods are to be printed. In the case of fabrics to be printed, it usually is necessary to have a fully bleached ground; the flannelette shown in Fig. 2 is an example. It has been found recently that the peroxide bleach facilitates napping and results in a loftier finish than is obtained on material bleached by the older methods. Modern practice, therefore, is to desize the fabric without singeing, bleach in a kier with peroxide, wash, and dry. The goods are then napped (or dyed before napping if a dyed ground is specified), printed, and given a final light napping. The 36-roller machine is the favorite for processing flannelettes, the longer-napped varieties of which are subjected to the felting action as in the case of blankets.

Since the majority of plain-dyed shades do not require a bleached ground, the common procedure is to desize, kier-boil with caustic soda, wash, dry, dye on jig or continuous machine, dry, and nap. An alternative method utilizes the semi-mercerizing treatment mentioned previously. In this method, the gray goods are boiled-out on a continuous open-width machine, the fabric being run through a solution of 30° Tw. caustic soda at 175° F. containing 1 to 2% of a suitable wetting agent, washed, soured, and washed. A fabric treated in this way—and then dried, dyed, dried, and napped—is shown in Fig. 3. This process speeds production, prevents creasing of heavy-weight goods, increases the affinity of the cotton for dyestuffs, and results in a fully shrunk fabric. When yardage does not permit use of the continuous machine, the goods can, of course, be given a similar treatment on the jig. In this case, drying after boiling-out is unnecessary and the fabric can be dyed without removing it from the jig.

Avoiding Streakiness

On account of the danger of streakiness on cotton doeskins, it is advisable to modify the process, napping before dyeing; also some of the higher qualities may require brushing and shearing. Cropped velvets are napped before bleaching. Some finishers bleach with peroxide in the kier, but it is preferable to use an open-width machine. After bleaching to a full white, the fabric is again napped, cropped, again napped and cropped, cleaned by blowing and suction cleaners, brushed, printed, and brushed; occasionally the back is given a light napping.

Dry Carbonizing

ORIGINATED FOR RAGS, NOW ADAPTED TO PROCESS RAW WOOL

ALTHOUGH dry carbonizing of rags has been used extensively in Europe, as far as is known only three American plants have the equipment necessary to carry out this process. For one reason or another, few thorough experiments have been carried out either here or abroad, in carbonizing raw wool, tops, or piece goods by the dry-gas method. There is in fact, only one plant handling raw wool at present, and none at all equipped to process piece goods. During the last year, however, several concerns have shown greater interest and have started experimental work.

Probably the best-known machine for dry carbonizing is the one made by Schirp in Germany, such as Henry Klous Co. has installed in its plant at Lawrence, Mass., to handle rags. The company is firmly of the opinion that the process is superior to the wet method, as the stock is left in a softer and stronger condition; also the treated stock is cleaner, since the carbonized cellulose materials do not turn black.

The two main parts of the machine are a retort for vaporizing hydrochloric acid and an inclosed drum in which the gas is applied to the rags. The retort is made of cast iron and is placed directly over a coke fire. Hydrochloric acid is admitted at the top through a $\frac{1}{4}$-in. pipe and is volatilized almost instantly by the temperature of about 1000° F. maintained in the retort. A fan blows the gas through a hollow axle into the rags. The cycle of operation is as follows:

The rags are placed in a perforated, cast-iron drum holding 1,200 lb., which is mounted on an axle so that it can be turned at the rate of 2 r.p.m. The whole is inclosed by a brick wall 16 in. thick, the only openings in which are the sliding doors, the hollow axle through which the gas enters, and the exhaust pipe. The chamber is equipped with heating pipes, and the first step is to dry the stock thoroughly. To do this, hot air is drawn from the retort (the acid being turned off), blown through the heating coils, and then through the hollow axle into the stock.

When the stock is thoroughly dried, the actual corbonizing is started. Acid is volatilized in the retort and blown into the chamber through the hollow axle until the desired density of gas has been obtained, depending upon the amount of vegetable matter in the stock. The temperature of the chamber is kept at about 150° F. The hollow axle and vent pipe are plugged and the stock continues to revolve for about 1 hr. The fan is then turned on and the gas blown out the ventilating pipe and up a chimney, where it is discharged 40 ft. above the ground.

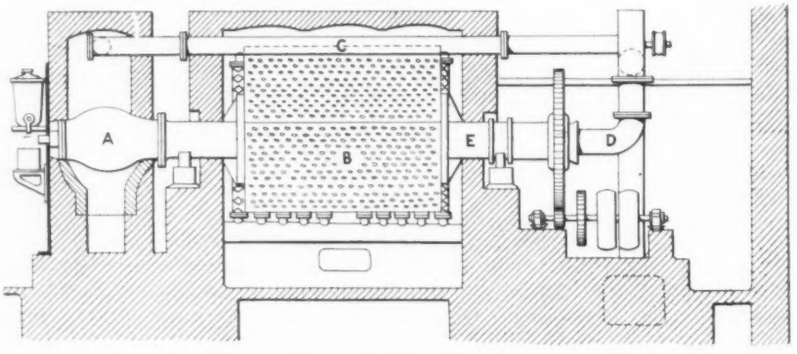
After all the gas has been removed from the chamber and stock, the doors are opened and the stock taken out and neutralized in the usual manner, the amount of soda ash being about one-third by weight of the hydrochloric acid used. The time taken from the loading until the stock is taken out is 4 hr.

The cost of processing by the dry-gas method is estimated by W. F. Brandy, treasurer of Henry Klous Co., to be only about 60% of that of the wet method. However, this cost is boosted because hydrochloric acid gas is highly corrosive, and it is necessary to replace the shaft piping and the exhaust pipe frequently. If replacements are taken into consideration, the total cost is just about the same as for the usual methods. Mr. Brandy states, however, that the stock is from 25 to 50% better. It is his opinion that the reason why there are not more dry-carbonizing units in operation is that there is practically no saving in cost and that, therefore, concerns are not inclined to scrap their existing wet-carbonizing equipment. In the case of his own company, the Schirp machine was put in five years ago when the plant was moved to its present location and there was an opportunity to start in with any desired method. The plant's location is such that the used gas can be vented. In crowded localities it would be necessary to use a condenser.

Several samples of piece goods have been placed in the machine and carbonized along with the rags. Results indicate that there is no reason why piece-goods cannot be processed, provided the necessary mechanical changes for handling the cloth are made.

Down in Hazardville, Conn., Gordon & Gordon have been working on the carbonizing of scoured wool for about two years and are now turning out 4,000 lb. of white wool per day. This organization has constructed its own equipment, and details of the system will not be available until patents are secured. Tops have also been processed, and the company sees no reason why piece goods should not be dry carbonized (an allied plant, Gordon Bros., Inc., handles rags by the dry-gas method). The following virtues of the dry process are claimed by the company:

1. Due to the low temperature used (150° F.), the color and the handle of the stock are not changed.
2. The fibers are not interfered with and the wool is just as lofty as before processing.
3. The spinnability and strength of the stock are not impaired.
4. Color of the dyed fabrics is bright and uniform and the handle is better.
5. Since there are no wet bowls in which wool may be lost, there is less shrinkage.



Rag carbonizing equipment similar in principle to machine described in this article. A = retort; B = perforated drum; C and D = pipes through which gas flows; E = hollow shaft.

Curled-Center Rugs

CONSTRUCTION OF AN INTERESTING MOHAIR FLOOR COVERING

By Ghent R. Robertshaw

THE curled-center mohair rug is an attractive and rather unique article of floor covering, and its manufacture is a matter of considerable interest to the fabric technician. The yarn used for the side and end borders is about 2/8 plain mohair, while for the center a 2/12 curled mohair is employed. The principal trick in the designing and weaving is of course that of keeping the plain end borders of the same appearance as the side borders.

The count of yarn to be used for ground and backing warps is 2/20 cotton. The ground warp is leased single ends; but the backing warp, as shown in the accompanying harness draft, is leased two ends as one and the two ends are drawn through one heddle. There are four ground ends per dent and four backing ends per dent, making the warps, which are on separate beams, equal in the number of ends.

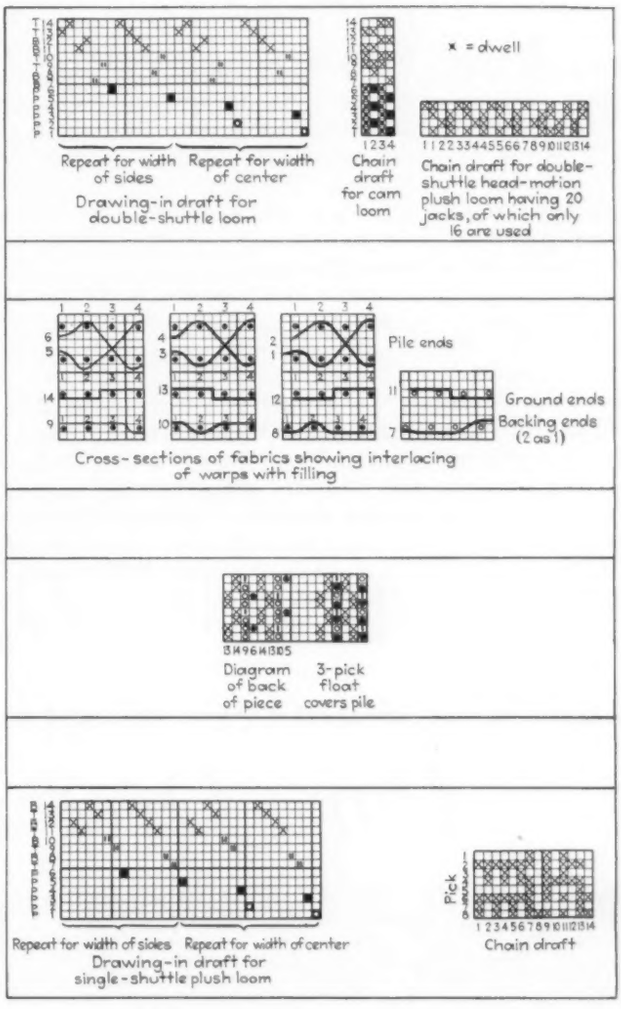
Advantages of Double Warp Yarn

The object of using 2/20 for backing warp instead of 2/10 is one of making a better warp; but an important advantage is that if an end breaks out during the weaving, there will be one left in the same heddle to stop the pile from pushing out of place in the back of the cloth. If a 2/10 were used, there would not be an end left in the heddle.

Both ground and backing warps are dyed an appropriate color, such as dark brown. The filling, which is an 8-lea linen or jute woven from cops, is dyed the same color as the cotton warps.

The rugs are made in various sizes and usually woven in cam looms. For purposes of illustration, I shall consider an 18 x 36-in. rug, with borders 4 in. wide and a center 10 in. by 28 in. (The borders on a 24 x 72-in. rug would be about 6 in., and other sizes in proportion.) Since the linen or jute filling does not shrink in the finishing, the warp count in the completed rug will be the same as the reed.

The curled-center yarn for an 18 x 36-in. rug is beamed in the center of a 10-in. beam, and the plain mohair yarn for the ends of the rug are beamed in the center of a beam of the same size. The sides are beamed 4 in. wide on both ends of a pile beam and weave continuously from one end of the rug to the other. The plain mohair forming the ends is floated on the back while the curled yarn is woven in the cloth, and the curled yarn is floated on the back at the ends of the rug. About 2 in. of plain cloth as a selvage is woven on each edge and on each end for binding before the heavy burlap back is sewed on after the face is dyed. Colors commonly used in the dyeing are red, green, brown, blue, olive, and taupe.


x = dwell
Repeat for width of sides
Repeat for width of center
Drawing-in draft for double-shuttle loom
1234
Chain draft for cam loom
1 1 2 2 3 3 4 4 5 5 6 6 7 8 9 10 11 12 13 14
Chain draft for double-shuttle head-motion plush loom having 20 jacks, of which only 16 are used
Pile ends
Ground ends
Backing ends (2 as 1)
Cross-sections of fabrics showing interlacing of warps with filling
3 1 4 9 6 14 13 10 5
Diagram of back of piece
3-pick float covers pile
Repeat for width of sides
Repeat for width of center
Drawing-in draft for single-shuttle plush loom
Pick
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Chain draft

Each mohair warp has a separate let-off. The one operating the yarn for the sides has a continuous drive, while the other two are alternately stopped, or practically so, while they give sufficient yarn to float on the back. The weaver should put in the required number of picks for the center ends of the rugs. Then he should disconnect harnesses 3 and 4 and connect harnesses 1 and 2, which were idling while the others were operating.

Various Looms May Be Used

The rug described can be woven on narrow 14-harness cam looms or on double-shuttle or single-shuttle plush looms. The harnesses would be distributed as follows: 1 and 2 for the curled center; 3 and 4 for the plain ends; 5 and 6 for the sides; 7, 8, 9, and10 for the backing; and 11, 12, 13, and 14 for the ground.

This rug can be produced by omitting the backing warp, using all cotton yarns, and backing the rug with rubber, the latter affording both weight and floor grip. It can also be made with a looped pile by means of special harness. When woven with pile wires, it commands a good price in the first-class stores.

DOES EDUCATION OF TEXTILE OPERATIVES LEAD TO

Migration?

(*From* TEXTILE WORLD'S *Southern Office*)

ILLITERACY among southern mill workers is becoming as extinct as the hand loom and the spinning wheel. This social change is due largely to (1) a sincere desire among manufacturers to improve the status of their workers, and (2) increased ambition on the part of the workers themselves. The question has often been raised whether or not such a procedure means immediate loss of good operatives to some more lucrative occupation or trade. To indicate at least a partial answer to this question a study was made of the trends in the Parker School District, Greenville, S. C., one of the outstanding examples of a successful educational system sponsored by textile mills.

Of the 250 students who entered the eighth grade of the Parker High School in 1933 and who are returning to enter the ninth grade, 128 are boys and 122 are girls. Of the 128 boys, 96, or 75%, have signified their intention to take vocational courses. Of these 96, 60 are studying textiles, 32 machine-shop practice and 4 mechanical drawing or drafting. Of the 32 who chose non-vocational courses, 22 are studying scientific subjects and 10 are pursuing liberal arts. Of the 60 studying textiles, 49, or 82%, are sons of persons employed in the mills.

Records show that vocational students, either upon graduating or dropping out, enter the mill 100%. Of the boys studying science and the liberal arts, at least 50% sooner or later enter the mill. In other words, out of a class of 128 boys, 112 or 88%, may be expected to become identified with the industry.

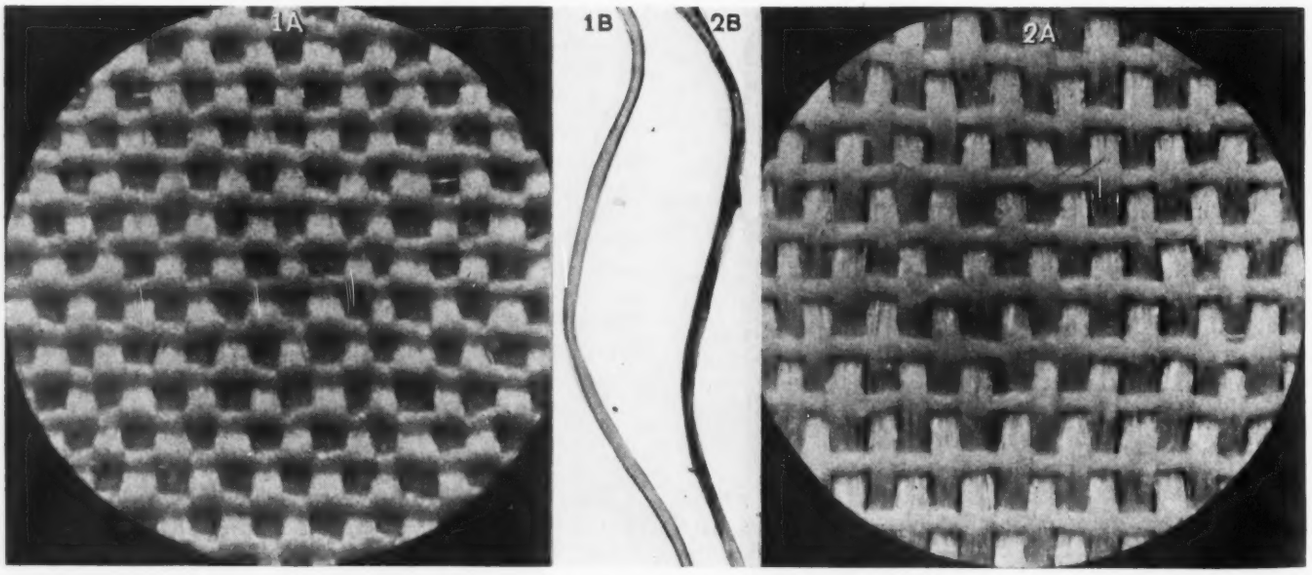
Although a large percentage of the 122 girls who entered the eighth grade in 1933 will go into mill work, the average is not as high as that for the boys because each year many of the former marry or enter institutions of higher rank.

In summary, of the entire student body, 66% of the pupils are members of families of whom at least one person is employed by a textile mill. Among the boys, 88% will enter the mills, although only about 82% are sons of persons employed there. Of the entire student body, probably 75% will go into textile mill work, although only 66% are children of persons so employed. Of those not graduating, nearly 90% enter the mill.

Obviously, from these figures, education is *not* causing a migration of potential textile workers to other fields.

PHOTOMICROGRAPHS OF SILK SHOW DIFFERENCES BETWEEN

Pure-Dyed and Weighted



CERTAIN of the differences between pure-dyed and weighted silk can be seen clearly from the accompanying photomicrographs. Fig. 1A shows a pure-dyed silk flat crepe magnified 32 diameters; Fig. 1B, silk filament taken therefrom and magnified 300 times. Fig. 2A shows a weighted-silk flat crepe magnified 32 diameters; Fig. 2B, silk filament taken therefrom and magnified 300 times. It will be noted that the pure-dyed fabric contains 18 warp threads and 13 filling threads, while the weighted fabric contains 17½ warp threads and only 9 filling threads. The microscope was set to cover the same area of fabric in each case. Although the pure-dyed silk specimen is actually lighter in weight than the weighted silk sample, it contains about 44% more filling threads. The deposit of weighting material in the nature of tin salts within the fiber itself and various encrustations thereof on the outward wall of the fiber are apparent in Fig. 2B. The photomicrographs are reproduced by courtesy of Real Silk Hosiery Mills, Inc., Indianapolis, Ind., and were made by Hatch & Reutlinger, consulting textile specialists, 366 Fifth Ave., New York.

Darning Cotton

MUST MEET FOUR IMPORTANT REQUIREMENTS

By L. L. Kingsford

◆ *Most textiles are expected to meet certain requirements, expressed or implied. Herein Mr. Kingsford discusses the necessary qualifications of a product about which very little has been written—although it is sold in practically every hamlet of the civilized world.*

THERE are four paramount qualifications required in a good darning cotton: softness, elasticity, strength, and covering ability. Softness is the first essential in repairing socks and stockings, because any undue hardness or stiffness of the darning material may give rise to foot trouble. Elasticity is important because of the strain that the darned section must undergo in the normal course of wear. A glance at one's stockinged feet while walking a few steps will tell more eloquently than the printed word can do just how great this strain is. Strength is requisite because there are times when the material reaches its elastic limit and the stretch gets to the point where only the strength of the darning yarn will stop an otherwise inevitable rupture of the threads.

The covering ability is that quality which helps the thread to fill the darned portion. A thread which answers this purpose must be of a fibrous nature, the fibers projecting and acting as a filler for the interspaces.

In winding the balls of darning cotton, it is well to produce a ball with a good degree of softness. There is a real sales psychology in doing so, because it is quite natural that a customer confronted with a choice of two different types of darning-cotton balls will give preference to the one which is the more yielding to her fingers. She has in mind the tenderness of feet in general. However, a ball which appears softer than some other make may actually have a harder yarn, so that the softness of a ball cannot be considered a criterion of the softness of the yarn itself. This fact must be borne in mind by the maker of darning cottons.

Darning cottons fall generally into two classes: plain and mercerized. While it may not be true in all cases, the plain yarns are usually somewhat coarser than the mercerized yarns, an estimate of the usual counts ranging from 25 to 30; whereas the mercerized material, being intended for a better, and consequently finer, grade of goods, has a range of counts from 30 to 40.

Usually the mercerized article is gassed, although this is not always so. Gassing, being resorted to for the removal of the extraneous fibers projecting from the body of the yarn, raises a question as to the covering ability, which has already been referred to as one of the prime qualities of a good darning cotton. However, the gassing or singeing is usually light, the exceptionally long fibers being partially removed and the short ones remaining, so that even after the usual gassing there remains a certain amount of the so-called covering capacity. Moreover, the mercerized article being in general somewhat finer than the plain, ungassed product, the finer diameter in itself aids in bringing about this desirable quality, because the finer threads have smaller interspacing to fill.

Mercerizing is done to enhance the appearance of the thread; and singeing, of course, also helps to bring about an improvement. It is obviously a difficult thing to ascertain just exactly how far the covering ability and the appearance of the thread counterbalance one another. The question as to whether the gassing adds or detracts from the ultimate sales value is a debatable one. The mercerization, in addition to giving the yarn a luster that heightens its appearance, also considerably augments its tensile strength.

Some of the manufacturing details of the usual darning cotton are listed below:

Counts	25 to 30	30 to 40
Spinning Twist	$\sqrt{\text{count}}$ times approx. 3	$\sqrt{\text{count}}$ times approx. 3 to 4
Ply Twist	$\sqrt{\text{count}}$ times approx. 2	$\sqrt{\text{count}}$ times approx. 2
Two-ply ends doubled together	2 to 4	1 to 4

The ply twist must be sufficient to give a reasonable amount of strength without endangering softness.

Care should be exercised throughout the carding and spinning to insure as even a thread as possible; and in the spinning especially it is well to have the operatives on the alert for lumps, large soft bits, and doubles. They must make their piecings carefully.

In the ply-twisting process attention must be given to the tapes or bands that drive the spindles so that no excessive variation in spindle speed will occur which would affect the twist of the yarn adversely. In changing twist gears, it should be especially noted whether the twist checks up correctly; and for this purpose at least ten bobbins should be tested for twist in order that a fair average may be obtained. This plan of testing the twist immediately after changing the twist gear gives an opportunity for correcting any trouble immediately upon its discovery, and it need not be said that correct twist in the ply product is all important.

In order to obtain a fluffy, hairy appearance resembling that of wool darning yarns, the yarn is ply twisted dry. Thus an opportunity is afforded for the loose fiber ends to assume a position at right angles to the thread.

There are certain defects that can and are made at the twisting process which must be closely guarded against, for they work adversely against the thread with respect to both its appearance and its subsequent use. Among these faults are singles, doubles, over and under twists, long-tail knots, excessive knots, bunches, snarls, and also defects which get through from the spinning process. Knowing that these faults are apt to occur, the operatives must be impressed with the importance of keeping them at a minimum.

Steam-Piping Data

FOR USE IN MAKING REPAIRS, CHANGES, AND EXTENSIONS

By Charles L. Hubbard

STEAM-PIPING systems employed in textile mills frequently require minor changes, repairs, extensions, etc., which ordinarily are carried out under the direction of engineer or master mechanic regularly employed in the plant. The purpose of the present article is to give in condensed form some of the more important data concerning the selection and erection of such piping as may be called for from time to time in the average mill.

According to the thickness of stock, steel and iron pipe are graded as "standard," "extra-strong," "double-extra strong." In general, standard pipe is considered amply strong for working pressures of 200 lb. for threaded joints, and 250 lb., for those of the Van Stone and similar types where the end of the pipe is not weakened. For superheated steam, it is customary to use extra-strong pipe on new work. Lap-welded pipe is considered somewhat more reliable than butt-welded for steam work and is usually preferred for sizes over 2 in.

Cast-iron fittings of standard weight are commonly used for pressures up to 125 lb., and extra-heavy above this to 250 lb. Higher pressures and super-heated steam call for special materials, such as malleable iron, steel, and steel alloys, although a moderate amount of superheat, say up to 100°, may be used with cast-iron fittings of the best quality with the pressures noted above. In most steam work, screwed fittings are used for sizes up to and including 2½ in., with flanges or brass unions so located as to provide a sufficient number of removable sections. For larger sizes, flanges are used in practically all high-pressure work, those of the Van Stone, or loose-flange type being widely employed, also the welded flange in some cases.

For low and medium pressures the inner edge of the flange may be slightly rounded, the pipe screwed through so as to project a small distance, then peened over and faced off in a lathe. The material and design of all valves and seats should be adapted to the pressure and temperature of the steam carried in the system. When there is sufficient space, valves of the outside screw and yoke type are preferable for 4-in. sizes and over. Large valves in high-pressure lines should be provided with a bypass for equalizing the pressure before opening the main valve.

Iron pipe fitted at a temperature of 50° expands about 3½ in. per 100 ft. in length when filled with saturated steam at 200 lb. pressure, and about 5½ in. when steam at the same pressure is superheated 200°. For this reason, the layout should be so planned as to take up the expansion and contraction without producing excessive strains in the pipe and fittings. For long runs of straight pipe, expansion joints of various types are available.

The inner radius of sweep bends should be equal to at least 5 pipe diameters, and sufficient straight stock should be left at the ends for handling and support. The length of pipe in bend or offset to take up a given expansion safely may be approximated from Table I.

All piping should be well supported in the manner best suited to its size and location, the supports being so placed and designed as to allow free movement in the direction of expansion and contraction. If possible, any tendency to vibration should be remedied at the source, rather than by attempting to brace the pipe. After this, if there is still some tendency to vibration, try spring hangers and cushions beneath the bases of the pipe roll supports.

Great care should be taken in designing a system of piping to eliminate pockets for the collection of condensation, and the drainage should be automatic so far as possible. When, for any reason, a pocket or low point cannot be avoided, it should be drained through a trap located near the point of connection with the main. Leads from steam headers should always be taken from the top or side, and the header itself drained through separate pipes. Steam lines should pitch downward at least ¼ in. every 10 ft. toward the point of drainage.

In general, short runs of piping in power-house work are based on the size of outlet left in the apparatus to be connected. When two or more branches are joined in a single main, the relation given in Table II may be used. For example, an 8-in. pipe will supply three 5-in. branches, and so on. For longer runs the pipe size may be based on velocity, allowing 6,000 and 8,000 ft. per minute for saturated and superheated steam, respectively, when supplied to engines, and 8,000 and 12,000 for turbines. Table III gives the weight of steam per minute which low-pressure heating mains will carry with a drop in pressure of ¼ lb. per 100 ft. length of run.

Table I. Length of pipe required in sweep bends to take up a given expansion

Total expansion in inches	Feet of pipe for different sizes				
	4-in. pipe	6-in. pipe	8-in. pipe	10-in. pipe	12-in. pipe
2	21	26	29	32	35
4	30	37	42	47	50
6	37	45	52	58	63
8	43	52	60	66	72

Table II. Number of branches of given size supplied by 3-in. to 12-in. mains

Pipe size	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.
3 in.	1	—	—	—	—	—
4 in.	2	1	—	—	—	—
5 in.	3	2	1	—	—	—
6 in.	5	3	2	1	—	—
8 in.	11	5	3	2	1	—
10 in.	20	10	5	3	2	1
12 in.	32	15	9	5	3	2

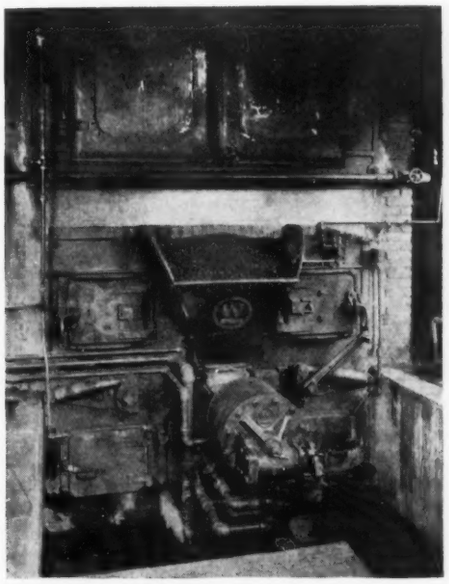
Table III. Capacity of low-pressure heating mains

Pipe Size	Lb. of Steam	Pipe Size	Lb. of Steam
3 in.	8.6	8 in.	108.0
4 in.	18.0	10 in.	192.0
5 in.	32.0	12 in.	305.0
6 in.	51.0	15 in.	535.0

MODERNIZATION OF BOILER ROOM IN TEN-SET WOOLEN MILL

Reduces Fuel Cost 35%

By T. M. Allen
Purchasing Agent,
James Irving & Sons, Inc.



Underfeed stoker installed on 190-hp. boiler at plant of James Irving & Sons.

THE experience of our plant at Chester, Pa., in modernizing its boiler room should be of interest to many. This mill has been engaged in the spinning of woolen yarns since 1909, and its equipment is typical of that of a ten-set woolen spinning mill. What has been done in this plant is typical of what can be done in many mills operating under similar circumstances.

First, let us review conditions as they existed in August, 1933. The mill was handicapped by the lack of steam generating capacity. The one 190-hp., h.r.t. boiler, hand-fired, could not produce all the steam required of it. As a result, the engine labored under low steam pressure and belts slipped, requiring frequent applications of belt dressing. It was often necessary to cut off the steam to the dyehouse to keep from shutting down the engine. The varying speed of the engine impaired the quality of the product.

The management, assisted by a Westinghouse engineer, made a survey of the plant from the viewpoint of correcting these difficulties. It was decided that the installation of a forced-draft underfeed stoker offered the best solution to the problem.

A Bailey flow meter was installed one month before the stoker, and performance data were collected for a period of 30 days with the boiler hand-fired. The test showed an over-all boiler and furnace efficiency of 55%. On Sept. 1 the stoker and auxiliary equipment were received. Installation was completed over the week-end, which included Labor Day.

Performance data for another 30-day period were taken, which showed an over-all boiler and furnace efficiency of 71%. A later test over a period of 10 days, after the firemen had become more familiar with the equipment, showed an efficiency of 79%. Fuel cost has been reduced 35% by the modernization undertaken.

The 190-hp. boiler, stoker-fired, now maintains the necessary steam pressure, with ample steam to meet all demands. The engine runs smoother, there is less belt slippage. The improved steam conditions have materially reduced the time required to boil the dye kettles. The mill output per man-hour has been considerably increased. Combustion without objectionable smoke is now had with a slack coal which costs (f.o.b. mine) 20% less than the run-of-mine previously used. The fireman, no longer chided by department heads for low steam pressure, takes pride in producing all the steam demanded of him.

The present equipment is as follows: boiler—190-hp., h.r.t. (Keeler); stoker—Westinghouse single-retort underfeed, grate area 36 sq.ft.; blowers—Wing Turboblower, Size 7-K-2; automatic regulation—one No. 2 Ruggles-Klingemann step-compensated damper regulator automatically controls speed of fan, stoker engine, and opening of boiler damper from the steam pressure; meters—Bailey Steam Flow—Air Flow meter; engine—125-hp. Corliss. The coal burned is ½-in. Beaver slack containing 14,500 B.t.u. as fired.

Sufficient furnace volume to insure smokeless combustion was obtained by setting the stokers in a pit 30 in. below the boiler-room floor line. A front view of the boiler and stoker is shown in the accompanying illustration. The fan is mounted on the stoker front and located directly under the stoker engine drive. The stoker and auxiliary equipment fully installed cost approximately $3,300. The general manager of the mill estimates that this equipment will pay for itself out of fuel saving and increased production of the plant in 18 months.

Why So Many?

FALLACY IN EXCESS WORSTED-DRAWING STEPS

SUMMARY TABLE

	Experiment No. 1		Experiment No. 2		
YARN DATA	**No. 1**	**No. 3**	**No. 1**	**No. 2**	**No. 3**
Total doublings	576,000	2,304	1,198,080	1,536	6,912
Ratio of doublings	250	1	780	1	4.5
Total operations	11	7	10	6	7
Effective draft	186	58	165	40	80
Total draft	63,600,000	84,520	45,980,000	57,400	279,936
Mean yarn number	2/31.5	2/31.7	2/34.6	2/36.2	2/34.3
Mean turns per inch	12.3	12.0	13.2	12.1	13.2
Single strand tests—ply					
Mean break—grams	353	356	232	237	248
Mean elongation—%	13.5	13.9	10.8	11.7	11.6
Skein tests—ply					
Mean break—lbs.	105.9	107.2	95.0	90.0	95.1
FABRIC DATA	**Strip Tests**		**Grab Tests**		
Ounces per square yard	5.41	5.16	7.82	7.85	8.4
Ounces per yard—54"	8.12	7.74	11.73	11.78	12.6
Mean break—lbs.					
Gray—warp	41.2	41.4	121.3	119.5	129.2
Gray—filling	34.4	34.8	54.8	61.5	59.0
Finished—warp	48.6	48.0	102.1	101.2	109.6
Finished—filling	32.8	33.4	40.6	40.0	41.8
COMPARISON FACTOR RATIOS					
Single-strand break	1.00	1.04	1.00	1.16	1.06
Skein break	1.00	1.05	1.00	1.08	0.99
Gray—warp break	1.00	1.06	1.00	1.12	1.08
Gray—filling break	1.00	1.05	1.00	1.12	1.06
Finished—warp break	1.00	0.99	1.00	1.13	1.05
Finished—filling break	1.00	1.05	1.00	1.07	1.04

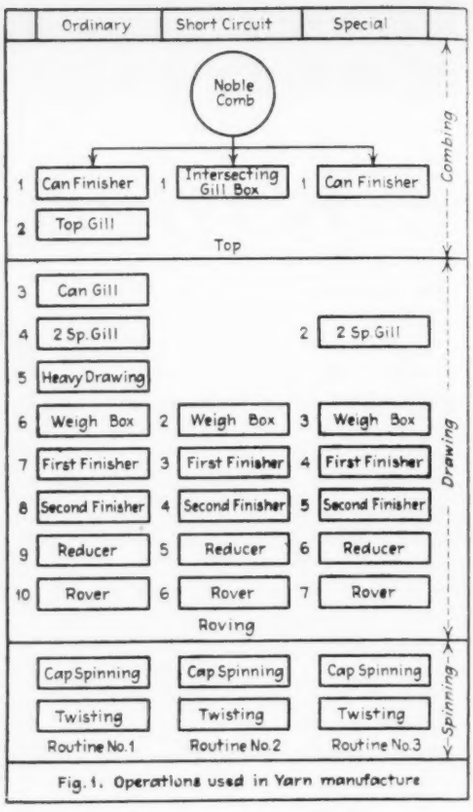


Fig. 1. Operations used in Yarn manufacture

BY extensive doubling after combing, the worsted mill increases the weight of the end of stock being drafted and hence is obliged to employ an excessive amount of draft to reduce that end to spinnable size. To ascertain whether there is any justification for this seemingly irrational practice has been the purpose of two thesis investigations conducted in recent years at Lowell Textile Institute. The first thesis was by Edward L. Wingate, Class of 1928; and the second was by Prof. John C. Lowe, of the institute's instructing staff, who received the textile-engineering degree in 1934.

In the latest issue of the institute's *Bulletin*, Professor Lowe elaborates on the theory which formed the basis of the study as follows: "Draft applied in successive operations to a single end will produce unevenness. It will be found that, in general, using no doublings, approximately three operations will be required to reduce top to roving. This suggests that all operations exceeding three are made necessary by the doublings used to maintain evenness. It follows that if a lighter-ounce top were used, the total reduction, from top to roving, would be lessened, unevenness due to drafting would be reduced, and therefore fewer operations would be necessary to produce roving. Maximum benefit should be obtained when increase in weight of the end from the Noble comb is avoided in any following operation."

The accompanying diagram shows the three routines used to produce yarns in the second experiment—all 2/36s count from 3/8s-blood recarded waste. Further details regarding the three yarns are given under the heading, "Experiment No. 2," in the above table, the yarns being numbered to correspond to the routines.

In the first experiment, 2/32s yarns were produced from 1/2-blood wool. Yarn No. 1 was given routine No. 1, except that an additional operation, fine drawing, followed the weigh box, making 11 operations in all. Yarn No. 3 was given routine No. 3.

Due to differences in yarn number and the turns per inch, the results of the experiments had to be interpreted in terms of comparison factor ratios. (See table.)

In addition to physical tests, both the yarns and the fabric made from them were examined by mill executives. These gentlemen found little difference in evenness between yarns 1 and 3 of experiment 1, but preferred yarn 3 for its elasticity. In the case of experiment 2 they found yarn 3 to be the most even and elastic. The mill executives favored fabric 3 of experiment 1 over fabric 1 for its better handle, but found no choice with respect to general evenness. Very little difference was discovered between fabrics 2 and 3 of experiment 2, but fabric 1 was found definitely inferior.

Professor Lowe draws the following conclusions:

"1. Excessive processing seems to affect the physical properties of the fiber, thus reducing both the strength and elasticity of the yarn, for in both experiments the ordinary yarn is inferior both in strength and elasticity.

"2. The superiority and strength of yarn 2 over that of yarn 3 in experiment 2 is wholly due to (a) the use of one intersecting gilling process instead of two ordinary gill boxes and (b) the increase of the weight of the end after it left the Noble comb for yarn 3. Therefore, intelligent use of the intersecting gill box should lead to a reduction in the number of operations required to reduce top to roving for any drawing system.

"3. Both experiments support the soundness of the theory that an avoidance of an increase in the weight of the end after it leaves the Noble comb would reduce the number of operations necessary to produce a satisfactory yarn, for in neither yarn nor fabric are the yarns processed by routine 1—ordinary procedure—superior to the yarns produced by routines 2 and 3."

Overseers' Round-Table, scheduled for this page in our Table of Contents, has been omitted from this issue to afford more space for treatment of the strike (which will be found on pages 89 to 94). We regret two other inaccuracies this change effected in that index. The Round-Table will appear next month.

A NEW SET-UP, INCLUDING GROWERS AND DEALERS, PROPOSED FOR

Wool Promotion

A NEW DEAL is recommended by the Promotion Committee of the National Association of Wool Manufacturers. In its report to the association, it urges that it be permitted to step out of the picture and that a new committee be appointed representing, in addition to the manufacturers' association, the National Wool Trade Association and the National Wool Growers Association.

It is suggested that this joint committee be composed originally of the presidents of the three associations, they between them to name the balance of the committee and to select and name a chairman.

The report presents three forceful reasons why action in this direction should be taken now:

1. It believes that a well-conceived capably executed program of promotion, consistently followed through for a period of at least three years, will return benefits to the industry far exceeding its cost.

2. It finds in the association and throughout the industry increasing enthusiasm for such a promotive program and believes that, more than ever before, there is a willingness to cooperate.

3. It is convinced that conditions are psychologically favorable now; with style acceptance favorable to wool, efforts of an educational or promotive nature will be doubly effective.

Wool promotion, the committee's report concludes, is too broad in scope to make it advisable or practicable for the manufacturers' association to undertake it alone. The National Wool Trade Association concurs in this view and has already voted a fund for national promotion and has appointed a field secretary, it is pointed out. The National Wool Growers Association is intensely interested and will cooperate actively as far as it can, it is stated. Consequently the committee believes "the time has come for these groups to join hands and work out a satisfactory program jointly."

Chairman Johnson's Personal Report

In line with a statement in the committee's report that "individual members who have decided views on the procedure to be followed will put their views on paper and give them to the new committee in order not to burden this report with too much detail," Col. Chas. F. H. Johnson, chairman of the committee, submitted a personal report. This surveyed the field of wool promotion, both as to past attempts and future policies. Significant extracts follow:

Individuals express sympathy with or enthusiasm for promotion but invariably preface their remarks or wind them up with the statement that "our industry must be sold." It is difficult to understand why our industry has not taken advantage of the same policies, practices and merchandising efforts which have proven helpful to others. . . .

To use the vernacular, wool in a style sense for the last few years has been fashion, it has had the breaks, it has been "a natural" and at this moment is in exactly that position. We are doing nothing to take advantage of this condition; instead we permit our market to gradually slip away in spite of many favorable factors. . . .

Quality has been repeatedly sacrificed to price until the word quality, as responsible manufacturers understand its meaning, no longer exists except in a most restricted volume. . . .

In making recommendations as to what we should do in a promotional way, it is well to think of things that stand out as not to be done. We must avoid insulting consumer intelligence with purely blatant statements that wool is healthful or that wool has greater wearing qualities or any one of the other stock arguments that are immediately advanced. . . .

Promotion does not merely mean advertising. It means exploitation of style, creation of wool consciousness, a follow-up of the wool trend, not by duplicating the Golden Fleece Pageant or the Wool Week but rather by being in close touch with the various showings throughout the country and making sure that wool has proper representation; doing away entirely with the idea of a Wool Week and carrying forward the idea of wool consciousness every day in the week for 52 weeks in the year. . . .

Methods of promotion may be varied: the radio, the movie, the magazine and probably the greatest of all, the newspaper, including consumer and trade papers. . . .

It seems difficult to believe that we will fail to recognize the value of helping to lift the bushel off our light, permitting that light to shed a warm glow upon our products, encouraging greater consumer use and less resistance, making quality rather than price the chief incentive, thereby encouraging greater creative effort, which should be helpful to our distributors as well as to ourselves.

LAST month, in these columns, we stated: "The wool industry, hard beset by difficulties for a number of years, has acquired more grief. Its position in the men's summer clothing field has been threatened by products of other fibers. . . . More creative styling, and more aggressive promotion, can help to hold a considerable portion of the business against any competition."

We find a substantiation of this thought in the personal report submitted by Col. Johnson, chairman of the Promotion Committee of the National Association of Wool Manufacturers. "One can only view with admiration," he says, "the progressive efforts of rayon and cotton manufacturers who have not hesitated to sing the praises of their products to the point that they have taken away from wool natural outlets. Note the steady absorption of the men's wear summer market."

If the wool industry does not want this situation, and other similar ones, to become progressively worse, it will act at once on the report submitted by the Promotion Committee. That report binds the industry to no set technique or personnel; it merely suggests motive power for starting something. There can be no excuse for further delay.—Editor.

Col. Chas. F. H. Johnson, chairman of Promotion Committee

QUESTIONS AND ANSWERS

Shrinkage of Canton Crepe

Technical Editor:

We are inclosing herewith a full-width sample of pure-dye canton crepe. The construction is as follows: 54/3/3; 47 in. reed; 52 picks of 10-thread, 20/22-denier Japan crepe, 50/55 turns; finished width 40¼ in. We feel that a filling as heavy as the one used in this construction should pull the cloth to a finished width of 38½ to 39 in. As the dyer is unable to finish this cloth any narrower, we feel that the crepe itself must be at fault. Will you kindly let us have your opinion as to why the filling did not contract the cloth down to 38½ in. (8137)

We are quite sure that this fabric can be brought down to 39 in. if it is properly processed. With the small sample which accompanied the inquiry it was possible to obtain a shrinkage of ½ in.; and we feel certain that with a full piece it would be possible to shrink it to the desired width. Fabrics of this type must be processed with extreme care; and as you did not give any information as to the procedure followed by your dyer, we are unable to criticize his methods in detail. We believe, however, that he did not process the material properly.

We could find no fault with the filling, as the twist and size were correct. Although we believe that the trouble in this particular case is due to faulty processing, we wish to emphasize that care should be taken in the weaving of this construction. Make certain that the tension of the warp is not too great; also have the loom set so that it will close a little earlier than usual, thereby causing the fabric to weave tighter.

▼

Preventing Curl in Balbriggan

Technical Editor:

I shall appreciate any information you can give me on how to prevent balbriggan cloth from curling after being cut. (8132)

A practical way to prevent balbriggan cloth from curling after being cut is to run the cloth, after it comes from the knitting machine, through a weak, lukewarm sizing bath made up of 3 oz. of cornstarch to 1 gal. of water. Any piece-dyeing or wetting-out machine can be used. Do not extract too dry. The starch will stay in until after the cloth is cut, eliminating trouble in machine finishing, but will work itself out before the garments are boxed, so that the cloth will be soft when the garments are ready to ship. A variation in the amount of starch may have to be made to fit individual mill conditions.

▼

Latches Fail to Open

Technical Editor:

I have 50 Scott & Williams Model K machines that are heavily magnetized. If there is anything you can suggest for overcoming this condition I would appreciate it very much, as I am having a lot of trouble with the latches failing to open. I am using Torrington needles. I am anxious to remedy this trouble as soon as possible. (8106)

Your machines are probably not permanently magnetized, but are placed in this condition temporarily while your motors are running. The best solution to the difficulty would be to place the matter in the hands of a competent electrician who could study the problem at close range. In lieu of a correction of the conditions responsible, you might run a wire along a row of machines, attaching it to a leg of each machine and grounding it on a radiator.

Magnetism is sometimes incorrectly blamed for the failure of latches to open. If the failure occurs after the finished stocking is pressed off the needles, the trouble may be due to a faulty latch opener. It is not uncommon for the circular-brush type of opener to be improperly set.

▼

Hard Finish Wanted

Technical Editor:

We are inclosing herewith a small sample of cloth with a hard, firm handle that we are unable to obtain. Our finish is more on the soft polo type, regardless of how hard we press the fabric. This sample was made from knits (old domestic) garnetted with a small percentage of rayon as a carrier staple. We are using 50% knits, 35% coarse merinos, and 15% garnetted rayon. In our opinion this should give a coarser, harder handle to the cloth than straight knits and rayon, but we are unable to get a hard and firm finish. (8147)

We are of the opinion that the sample made from knits garnetted with a small percentage of rayon is more likely to give a sharp touch, while the stock that you are using will finish with a soft handle and it will be necessary to use a sizing material. Sizing products which will give a hard or crisp effect without adding weight can be obtained from various manufacturers of textile chemicals.

▼

Sizing Sash Cord

Technical Editor:

Some time ago you sent us information for the sizing and polishing of sash cord. This proved to be a big help to us. At this time we would like to have you advise us what method and what materials are used in the sizing, weighting, and stiffening of the core that is in the center of sash cord. (8149)

There are two kinds of cores used in the center of sash cords. One is a cotton core and can be sized in the same way as the entire sash cord, with the exception that lithopone can be replaced with china clay or some other inert loading agent, because it is not necessary to produce a dead-white finish on this cord.

When a jute or hemp core is used and it is desirable to size this core separately, a good, heavy size formula would be as follows: 25 lb. thin-boiling cornstarch, 18 lb. canary dextrin, 3 lb. sulphonated tallow, and 5 lb. Japan wax or paraffin wax. This will make 50 to 55 gal. of cooked size. The starch and dextrins are mixed with cold water for 10 to 15 min. and then brought to a boil. Next the sulphonated tallow and Japan or paraffin wax are stirred in and the entire mixture cooked and stirred for 10 min. Then one pail of standard China clay solution is added, and the whole cooked and stirred for 5 min., after which the solution is ready to apply to the core. It should be applied at a temperature of at least 190° F. The core can be impregnated with this mixture and dried. It is not necessary or desirable to polish the core, for any roughness will assist in making the braided wrapper adhere to the core more firmly, thus preventing sliding of the outside along the core.

▼

Knit-Outerwear Design

Technical Editor:

I am very much interested in J. Frederick Cahill's friendly argument in the May TEXTILE WORLD, page 118, pertaining to my article published in the Feb. 14 TEXTILE WORLD. He calls the article misleading, and bases his comments largely on loop-wheel spring-needle machines. In order to produce this pattern on such machines, the pattern field, size of cylinder, gage, etc., would have to be entirely different from those in the case of latch-needle machines.

I feel that the size of herringbone and the number of needles in the pattern field (24) which I specified are the best for the fabric I described and which I am illustrating herewith. It should be obvious that a smaller herringbone would give a different appearance in the fabric.

Mr. Cahill has given five different pattern wheels which will produce the same pattern. It is surprising to me that he did not mention a wheel that covers 48 needles once around, as 24 will divide into this wheel. The first wheel that he has given covers 72 needles once around, and has three parts of 24 each ($3\times24=72$); and he states this pattern can be reproduced with one of these wheels. The 48 wheel, or the 72 wheel, we know would be too small. When we decrease the number of parts in our wheel, we also decrease the courses in our pattern field, for by multiplying the parts in our pattern wheel by the number of pattern wheels gives us the courses in the field. In this case we would have a pattern field 24 needles long with only three courses.

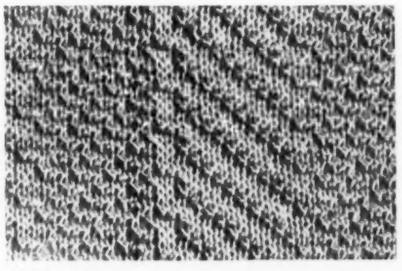
Next Mr. Cahill says that the pattern can be reproduced by using two pattern wheels that cover 96 needles once around. This would give us a pattern field 24 needles long and eight courses high ($2\times4=8$). In the third case he suggests using three wheels that cover 120 needles once around; and if we used such wheels, we would have five parts, 24 needles in each part ($5\times24=120$) and would be using three pattern wheels ($3\times5=15$). This would give us a pattern field 24 needles long and 15 courses high. Then he suggests using one wheel of 144. This would have six equal parts, of 24 in. each, and would

QUESTIONS AND ANSWERS

give us a pattern field of 24 needles long with six courses high. The last wheel that he mentions covers 168 needles once around. This would have seven parts ($7\times24=168$) and would give us a pattern field 24 needles long with seven courses. The last two wheels mentioned would be too large.

I don't know whether Mr. Cahill meant to use these wheels single, as he has outlined, or whether he meant to use wheels of different cut on the machine, which requires eight. If the latter is the case, the machine shop would be busy figuring out the different sizes to knit a small order, such as, say, 5 to 50 lb. on this pattern. I clearly specified a Brinton sinker-top cylinder, latch-needle machine, with sixteen feeds and with 984 needles in cylinder. It would not be practical for a knitter on latch-needle machines to discontinue any number of feeds for small orders in pattern work. Even in the case of loop-wheel spring-needle machines, there are a very few companies today which will attempt to produce pattern work on anything less than a six-feed machine, as the production is too slow.

When I drafted the herringbone pattern, I selected 120 for the pattern



wheel because anything smaller would have been too small and anything larger would have been too large. Under other circumstances it might have been possible to use a wheel that covered 96 needles once around, but the 120 wheel was the only one that the manufacturer had on hand entirely adapted for this work.

Mr. Cahill's comments would be found misleading and confusing to many knitters. If a knitter without pattern-work experience should try to make this herringbone pattern on a loop-wheel spring-needle machine, following the method proposed for a latch-needle machine, he would (assuming he encountered no difficulty in applying sixteen feeds, including pattern wheels) become hopelessly confused in connection with such matters as size of cylinder, number of needles in cylinder, gage of machine, etc. In reading the paragraph where Mr. Cahill mentions several pattern wheels, the inexperienced knitter might think that, in the case of the recommendation for a wheel that covers 72 needles once around, he would be supposed to use one wheel with a plain feed. What would he do with his other fourteen feeds? In the case of the 96 wheel, the knitter would understand that he was to use two pattern wheels with two plain feeds. What would he do with his other twelve feeds? With three

wheels of 120, he would naturally use three plain feeds, leaving ten feeds, and so on. Again, the knitter might assume that he would be expected to have made up for this pattern one wheel that covers 72 needles once around, two wheels of 96, three wheels of 120, one wheel of 144, and one wheel of 168, which when added up gives eight wheels. This would be a mixed-up mess for any knitter. I would like Mr. Cahill to explain the method of drafting a pattern onto a pattern field using five different cut wheels in one pattern.

I will admit that Mr. Cahill is correct with respect to the mixing of a pattern, and especially on this type of machine; but nevertheless these machines are very simple for turning out a variety of patterns.

I have made this particular pattern repeatedly in the manner I have outlined, and it has given entire satisfaction.

LESLIE MINER.

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Defect in Velvet Carpeting

Technical Editor:

We are weaving a two-shot velvet carpeting using a stationary pile wire. After the pile is cut, we have one high pile pick and one low pile pick. Our back is clean and harnesses are level, but we cannot seem to overcome this high and low effect. We would appreciate an early reply as to what would be necessary to overcome this defect. (8142)

This defect may be caused by running the pile yarn from a beam, and not from creel spools, which is the common practice on Wiltons. On stationary wires, the knives will cut one side of the yarn a little longer than the other, which makes a ridge the length of the goods. This perhaps is your difficulty. It can be caused by the butt ends of the wires not fitting snugly against each other, allowing the wires to tilt sideways so they do not cut the center of the loop. It can also be caused by having a wire twisted a little near the part holding the knife. If there are any tight threads on the pile warp, they will have a tendency to pull hard on the wires and tilt them. A dull knife may have the same effect.

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Core Yarn

Technical Editor:

In the May issue of TEXTILE WORLD [page 119] a gentleman questions the core-yarn methods described in a previous article ["Core Yarn," March, page 69] relative to the use of a single thread and the purchase of cotton-system yarn being more expensive than making your own for this purpose. The very nature of a woolen-system cotton yarn might permit its use singly in core yarn and prevent slippage of the outside wool fibers. Previous to NRA and its codes we always found it more economical to buy cotton yarn than to manufacture it ourselves.

P. M. CROFTS.

▼

Novelty Yarns

Technical Editor:

I note in the questions and answers section of the June issue, page 118, that a reference is made to my article on novelty yarns in the August, 1933, issue. In order to be helpful, I wish to say a few words on the subject.

First, I have learned from experience that it is most difficult and expensive to secure elliptical gears if no samples are available. I mean very few men are able to design such a gear before cutting.

Another thing, your inquirer asks what number of teeth and pitch of gear are needed to produce Himalaya. I find that the number of teeth and the pitch have nothing whatever to do with the producing of the Himalaya effect. Everything depends solely on *the shape* of the gear, because both ellipticals are of the same number of teeth (necessarily) and these gears act merely as carriers or intermediate gears. Therefore, the only reason pitch and number of teeth are given consideration is on account of the space available in setting up the mechanism.

ARTHUR OUIMET.

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Elasticity in Wool Rib

Technical Editor:

We inclose two samples of heavy elastic wool rib. You will note that No. 1 does not have the same elasticity or spring as No. 2. Both samples are knit from about the same quality of yarn and stitches per inch. Would you advise us what the trouble is with No. 1? Is it due to the setting of the knitting machine, to the respective sizes of the different cylinders, or to trouble in the finishing? In other words, just what gives No. 2 such a springy feel as compared with No. 1? (8115)

Since you do not give the knitting-machine details and have not supplied any unfinished material, it is not practical to try to judge the machine differences. A study of the finished pieces shows the following:

Sample 1

Wales per Inch	*Courses per Inch*
8	12
7½	12
8	12
—	—
8 Avge.	12 Avge.

Sample 2

Wales per Inch	*Courses per Inch*
9½	14
9	14
9	14
—	—
9 Avge.	14 Avge.

From this table, it is quite clear that the wales are closer and that there are more courses per inch in sample No. 2. This is sufficient to explain the difference in elasticity. If the two pieces are knitted alike, the trouble must come from stretching sample No. 1 too much in finishing.

THE PERSONAL PAGE

W. V. Lawson assists Sloan

William V. Lawson, who resigned recently as acting director of NRA public relations, has been appointed assistant to George Sloan, president of The Cotton-Textile Institute, in the capacity of public relations counsel. He has had experience in both newspaper and advertising agency work. He was Washington correspondent for the Chicago *Tribune* for six years and was for some time Detroit representative of N. W. Ayer & Son Inc., later joining the staff of the Detroit *Times*. He went from the latter connection to the NRA work.

W. Ray Bell heads merchants

A. M. Dixon on labor board

W. Ray Bell, who has been secretary of the Association of Cotton Textile Merchants of New York since 1932, has been elected president and will serve in the dual capacity. As president, he succeeds **Magruder Dent,** of Joshua L. Baily & Co., who has been serving his second term. This plan of reorganization has been contemplated for some time. Other officers are **Harry L. Bailey,** of Wellington Sears Co., vice-president, and **John C. Hughes, Jr.,** of McCampbell & Co., Inc., treasurer.

Arthur M. Dixon, vice-president and assistant treasurer, American Yarn and Processing Co., Mount Holly, N. C., and **C. M. Fox,** Shelby, N. C., have been appointed to fill vacancies on the Cotton Textile National Industrial Relations Board.

Charles R. Collins, formerly treasurer of Clover (S. C.) Mills Co., who was recently elected president of Collins Mfg. Co., Elk Mountain, N. C., has taken over the management of Pisgah Mills, Inc., Brevard, N. C.

H. W. Jordan has become president of the newly organized Meherrin Mills Corp., Emporia, Va.

D. B. Johnson has been elected president of the Grace Cotton Mills, successor to the James Cotton Mill, Lincolnton, N. C. **R. J. Woods** is vice-president.

John L. Koehne, formerly executive vice-president, has been named president of C. K. Eagle & Co., New York.

Arthur K. Deal has been elected president of the newly organized Regal Silk Hosiery Mills at Petersburg, Va. **J. E. Green** was chosen vice-president and **Edward D. Lucas,** secretary.

E. L. Skipper has become general manager of the Lancaster, S. C., plant of the Springs Cotton Mills. He was formerly general manager of the Fort Mill plants. He succeeds **F. Gordon Cobb,** who assumes other duties with the Springs organization.

Calvin E. Sweet has been placed in charge of the Royal Mill, Riverpoint, R. I., the Artic (R. I.) Mill, and the Grant Mill in Providence, all units of B. B. & R. Knight Corp., and will rank as general superintendent. He will be assisted by **Charles Haynes.**

Stanley A. Black, manager of the Oakland plant of Kendall Co., Newberry, S. C., has been promoted to assistant to **H. K. Hallet,** general manager of the Kendall organization in the South. Mr. Black's headquarters will be in Charlotte, N. C. He is succeeded at the Oakland plant by **Ben A. Knowlton.**

James D. Holmes, Jr., formerly with Locke Cotton Mills Co., Concord, N. C., has resigned to become secretary of Lake City Hosiery Mill, Marion, N. C.

Harry Levy has joined the Sturbridge (Mass.) Finishing Co. and the Southbridge (Mass.) Finishing Co. and will act as assistant to **Bernard Golding,** treasurer and general manager of both plants.

John K. Voehringer, Jr., president of the Mock, Judson, Voehringer Co., Inc., hosiery manufacturers, Greensboro, N. C., is now a full-fledged Kentucky colonel and a member of the staff of Governor Laffoon of Kentucky. The commission was executed in recognition of Mr. Voehringer's contribution to the constructive development of the Southern States and his position as "one of the leading industrialists in the country."

H. B. Dowell, manager of the Bradford Mills, operating units at Montgomery, Ala., and at Prattville, Ala., has been appointed manager of the Cloverdale Mills of that city, also which will be put into operation within a short while.

Samuel Kershaw, F.T.I., English authority on worsted manufacture, has been appointed head of textile department, Technical College, Halifax, England.

Callaway Mills, LaGrange, Ga., has made the following changes in personnel: **Ed Estes** has resigned as superintendent, Valway Rug Mills, Inc., to accept a position with Eagle & Phenix Mills, Columbus, Ga.; succeeded by **W. P. Dunston,** formerly superintendent Unity Cotton Mills. Mr. Dunston is succeeded by **C. Y. Hall, Jr.,** formerly overseer spinning and spooling at the Unity plant.

L. B. Wilcox has resigned as secretary and sales manager of Hemphill Co. and become associated in a technical capacity with Interwoven Stocking Co., New Brunswick, N. J.

Norman B. Hill has returned to his former position as superintendent of Caswell Mills, Inc., Kinston, N. C.

Homer Lee Ballard has resigned his position with Cannon Mills Co., Kannapolis, N. C., to become superintendent of Roxboro (N. C.) Cotton Mills. He is succeeded by **Lacy Moulden.**

James M. Bailey has been appointed superintendent of the Slater (S. C.) Mfg. Co. He was promoted to this position from that of production manager. **C. R. Barton** has been appointed production manager, succeeding Mr. Bailey.

F. Michaud, superintendent of the St. Ann's branch of Dominion Textile Co., Ltd., Montreal, was recently appointed assistant superintendent of the Hochelaga Branch of the firm, a move made necessary by the closing of the St. Ann's mill.

J. L. Kahn has taken the position as superintendent of the Beaunit Weaving Mills, Cohoes, N. Y.

Louis E. Mellor of Guilford was elected president of the Woolen Mill Overseers' Association of Eastern Maine at the annual meetig. Other officers elected were: first vice-president, **John R. Garraty;** second vice-president, **John D. Richards;** secretary, **Lewis D. Sands.**

H. H. Wood has become assistant superintendent of Oconee Textiles, Inc., Westminster, S. C.

James B. Griffin has become superintendent of the Springfield plant of the Morgan Mills, Laurel Hill, N. C.

T. A. Ballard, formerly superintendent of Clover (S. C.) Mills Co., has been appointed superintendent of Collins Mfg. Co., Elk Mountain, N. C., which began operations about Aug. 20.

J. A. Ross has accepted the position as superintendent of the day weaving division at the Waxahachie (Texas) Cotton Mills, succeeding **W. B. Holt** who resigned and has gone to Roanoke Rapids, N. C. **R. S. Mitchem** has accepted the position of superintendent of the carding division.

Textile Calendar

National Association of Cotton Manufacturers, Annual Meeting, Copley-Plaza Hotel, Boston, Mass., Oct. 10, 1934.

Southern Textile Exposition, Eleventh Annual Exhibit, Textile Hall, Greenville, S. C., Oct. 15 to 20, 1934.

American Society of Mechanical Engineers, Textile Division, meeting with Greenville Section, Greenville, S. C., Oct. 15, 1934.

Federated Textile Industries, Inc., successor to Silk Association of America, Annual Dinner, Waldorf-Astoria Hotel, New York, Feb. 28, 1935.

Knitting Arts Exhibition, Commercial Museum, Philadelphia, Pa., Apr. 22-26, 1935.

John C. Adams has accepted the position of superintendent of the No. 1 unit of the Hannah Pickett Mills, Rockingham, N. C., succeeding **I. N. Dunn,** who has become superintendent of the Edna Mills Corp., Reidsville, N. C., succeeding **I. W. Wigington.**

William J. Crummer, active in the knitting trade for the last 14 years, has joined the staff of Oscar Heineman Corp., Chicago, and will be in charge of the Philadelphia office.

William Baum, industrial engineer, Real Silk Hosiery Mills, Indianapolis, will teach a class in factory management for the Indiana University extension division beginning Sept. 20.

Paul Jackson, general sales manager, Pepperell Mfg. Co., New York, will retire on Oct. 1.

C. T. Freeman, formerly general overseer of preparation at North Carolina Silk Mills, Burlington, N. C., has accepted a similar position at Central Falls (N. C.) Mfg. Co.

James T. Kennedy and **F. S. Moore,** overseer of carding and of spinning, respectively, at Rockford (Ill.) Mitten & Hosiery Co., have worked together for over 35 years with that same company. The believe that constitutes a record unsurpassed by any other pair of carders and spinners.

Arthur H. Mason, superintendent, National Weaving Co., Lowell, N. C., recently announced his resignation.

H. H. Wood, Oconee Textiles, Inc., Westminster, S. C., has been made assistant superintendent.

J. W. Skipper, for last two years general overseer of carding and spinning for the Alabama Mills Co., has resigned to become assistant superintendent, Aponaug Mfg. Co., Kosciusko, Miss.

Obituary

Frederic W. Howe

Frederic W. Howe, aged 59, vice-president and a director of Crompton & Knowles Loom Works, Worcester, Mass., died at the Truesdale Hospital, Fall River, on Aug. 16. He was with the company for more than 35 years and acted as manager of the Providence branch from 1902 until its discontinuance in 1932. Mr. Howe was vice-president and a director of the American Wringer Co., Woonsocket, and a director of the Booth Mfg. Co., New Bedford; the Old Colony Silk Mills, New Bedford, and the Waypoyset Mfg. Co., Central Falls, R. I.

Isaac Robison, aged 49, president of the Robison Rayon Co., Pawtucket, R. I., died suddenly in Cleveland Aug. 22.

Reuben C. Small, aged 75, treasurer of Small Brothers Mfg. Co., Fall River, died Aug. 26. Mr. Small was also a director of the Charlton Mills, Fall River, and Walker Webbing Co., Providence.

H. L. Shuttleworth, aged 73, one of the founders of the Mohawk Carpet Mills, Amsterdam, N. Y., and president until five years ago, died at his home there on Aug. 15.

Oscar Nebel, head of Oscar Nebel Co., Inc., Hatboro, Pa., died Aug. 5 in Munich, Germany.

J. N. Smith, aged 72, who was superintendent of the Woodruff (S. C.) Cotton Mills (now Brandon Corp.) for 29 years, died Aug. 18.

Ernest E. Pottberg, of Brune, Pottberg & Co., New York, was killed in the "Morro Castle" disaster. He was 49 years old.

Franklin D. Williams, president of Taunton (Mass.) Knitting Mills, died Sept. 6, aged 73.

T. D. Webb, aged 69, vice-president of the American Laundry Machinery Co., died at his country home in Remensburg, Long Island, on Aug. 21.

J. C. Saunders, for 30 years manager of Bonham (Tex.) Cotton Mills, died recently after several months' illness.

C. H. Billings, aged 68, superintendent, Lebanon (Tenn.) Woolen Mills, died last month.

Warren S. Peters, Arlington, Mass., formerly superintendent for 25 years of the Assabet Mfg. Co. at Maynard, Mass., died Aug. 27. He was born in 1845.

A. P. Thorpe, president of the Rocky Mount (N. C.) Mills, died suddenly in Philadelphia on Aug. 29. The funeral was at Rocky Mount. He was 74 years old.

B. Marvin Corlette, aged 56, founder and former president of the Belle Meade Hosiery Mill, Nashville, Tenn., died recently following a heart attack.

John A. B. Daye, designer and superintendent of the Crown Woolen Mills, Marcellus, N. Y., for the last 43 years, died August 11 at his home in that town.

Waddy C. Thomson, secretary-treasurer of Lancaster (S. C.) Cotton Mills from organization in 1895 to 1926 when he retired, died Sept. 6 at age of 78. He was also an officer of Springs Cotton Mills, Eureka Cotton Mills, Fort Mill Mfg. Co., and others.

O. W. Smith, overseer of spinning, Trion (Ga.) Co., died suddenly at his home on Sept. 6 due to heart strain induced by the textile strike.

Textile Hall Ready

Final touches are being applied to Textile Hall in anticipation of the Southern Textile Exposition to be held Oct. 15 to 20 at Greenville, S. C., according to W. G. Sirrine, president and treasurer, Textile Hall Corp. For more than a month, carpenters and painters have been busy repairing and repainting the entire interior of the main building. The 60x200-ft. annex is now complete and all space has been rented to exhibitors. Practically the entire first and second floors have also been rented. Decorations this year will be very colorful, consisting primarily of Castillian red and Spanish yellow broadcloth. Already, 120,000 tickets have been printed and are ready for distribution.

Why the Low Productivity of Textile Workers?

In an interesting study published in booklet form by the Emmons Loom Harness Co., Lawrence, Mass., the following are advanced as the major factors in the low productivity per cotton mill worker:

1. The long-term and steady decline in mill margins has reduced the value of the average worker's output;
2. The number of pounds produced per worker has not increased sufficiently to offset even in large part the decline in margin;
3. Other industries have increased physical output per worker at great rates by improvement in processes and equipment;
4. The cotton textile industry on the whole has not been able to create an experimental fund with which to finance research and invention because too great a share of the values it produces is absorbed by its payroll;
5. In consequence, the number of pounds of cotton processed per worker increased only about 15% between 1923 and 1931.

Such facts indicate, it is concluded, that at least one major reason for the difficulties of the cotton textile industry lies in the excessively large proportion of its income paid out as wages during the last 12 to 14 years; and that, had that percentage been no more than the average for other industries, the condition of cotton mills today (and their employees) would be far better than it is.

New Elastic Textiles

Stretch-Tex—a new cut-rubber webbing for use in men's, women's, and children's wear—is being introduced by American Mills Co., New Haven, Conn. According to J. D. MacNish, general sales manager of the company, the rubber thread in this new webbing is especially treated in manufacture by a process which makes it resistant to commercial cleaning fluids.

Columbia Textile Courses

Schedule of evening textile courses at Columbia University, New York, for this fall has been announced. H. R. Mauersberger is in charge. They include: Spinning and Weaving of Cotton, Monday nights, beginning Oct. 1, by Mr. Mauersberger; Spinning and Weaving of Rayon, Thursday nights, beginning Sept. 27, by Mr. Mauersberger; Design for Textiles, Monday nights, beginning Oct. 1, by William H. Arlt. Registration begins Sept. 19.

Philadelphia Courses

The Department of Chemistry and Dyeing of the Philadelphia Textile School has announced two new courses in its evening school starting Oct. 1. One course deals with the origin, chemical and physical properties, and microscopy of the various fibers used for textile purposes. The other is an introductory course in textile chemistry.

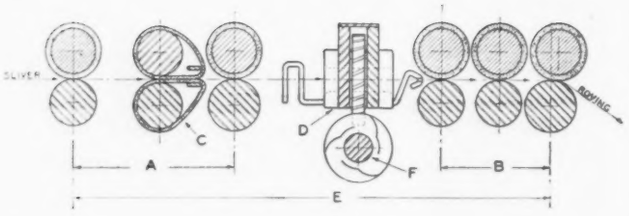
Evening Course by Chittick

A textile course from raw material to finished fabric, covering silks, cottons, rayons, woolens, pile fabrics, linens, etc., will be given by James Chittick, consulting textile specialist, New York, who has held these classes for many years. The 16 Monday evening sessions begin on Sept. 30.

Silk and Rayon Course

The silk and rayon merchandising and manufacturing course at the Textile High School, New York, opened for the seventh year on Monday, Sept. 10.

NEW MACHINERY



Super-Draft Roving

Through the adoption of a mechanism for inserting false twist in the roving, Whitin Machine Works, Whitinsville, Mass., has succeeded in combining a long-draft slubbing operation with a roving operation to produce what is to be known as the "Super-Draft" roving system. Since the company's long-draft roving system is adequate for the manufacture of cotton yarns coarser than 30s, the new system will be used only for the finer yarns. It is capable of drafts up to 40 and will produce roving as fine as 6.00-hank from cans of finished drawing sliver. Tests conducted by the machine builder show yarn produced by Super-Draft to be at least equal to that produced from the same sliver by three- and four-process roving.

The accompanying diagram clearly shows the principle of the mechanism. The sliver enters, in effect, a Whitin-Casablancas long-draft slubber at the left, the back roll scarcely turning. After leaving the slubber section, it passes through a revolving piece so designed as to insert a false twist, which pulls in the selvages. Then it goes through a regular set of roving drafting rolls. The first draft at **A** is 7 to 10, made possible by the apron assembly **C**. Between **A** and **B** a draft of about 1.25 is provided. Since the false twist provided by the twister head, **D**, runs to the thin places, this intermediate draft takes effect mostly at the thick places, thus evening the roving. At **B** the draft is 5 to 6. The total draft **E** is of course the product of Draft **A** times 1.25 times Draft **B**. Worm shaft **F** drives the twister head.

The new process reduces the amount of stretching, piecing, and fiber breakage to which roving is usually subjected. Creeling is reduced to a negligible factor, since on 5.00-hank roving, for example, a can will require 87 hr. to run out. A mill installing this system will find it necessary to purchase additional cans and allow considerably more room than was formerly required for the roving operations. Because of these facts it is expected that some mills will prefer to produce bobbins of very coarse roving—say, 0.25-hank—on slubbers in order that creels, instead of cans, may be used at the Super-Draft frames. Such slubbers would, of course, operate at a very high production.

Automatic Pump Controller

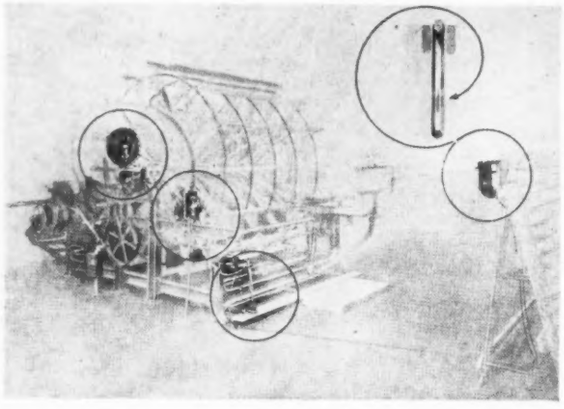
To eliminate surging effects in liquid conveyors, an automatic pump controller featuring an electrical "snubber" or time delay instead of the usual air cushion tank or needle valve, has been developed by Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. All essential elements (pressure units, relays, snubbers, etc.) are mounted in a compact steel cabinet, of which cover, top, and bottom plates are removable. Pipe connections are provided externally for pressure line, and knockouts in the top plate for electrical connections.

Stop Motion and Lease Dial for Silk and Rayon Warpers

Development of an electrical stop motion and lease dial for silk and rayon warpers has been announced recently by T. C. Entwhistle Co., Lowell, Mass. The equipment consists of four main units: (1) A bank of drop wires suspended over an electrode bar at the creel; (2) a clutch lock and magnetic knock-off mechanism; (3) a signal light; and (4) a lease dial.

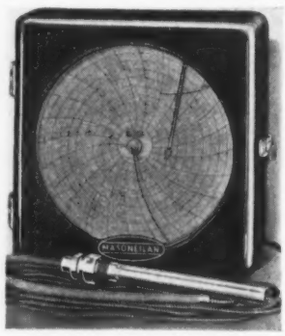
When an end breaks, the drop wire falls and comes in contact with the electrode bar. This closes the circuit and a current of electricity passes into a magnet which operates the knock-off mechanism, stopping the machine. The inside top edge of the drop wire is cut at an angle to give a wedging action to the fall of the wire and thus to assure instant and positive electrical connection. The signal light is the operator's means of knowing that the electrical circuit in the stop motion is in working order. The light shows her that there are no blown fuses, or other electrical defects. By setting of one or more "hunting teeth" at the proper locations on the lease dial, the operator causes the warper to stop automatically at the required leasing intervals and at the end of a section.

Advantages cited for the stop motion and lease dial include the following: No longer does the operator have to stand with her foot pressing constantly on the treadle, because the initial pressure of her foot locks the clutch in contact. Thus she can relax and give better attention to other important details. At the same time, the warper runs at a constant speed instead of a variable speed. This latter fact in itself will increase production (probably up to 5%), even though the warper is run at the same speed as before. However with the automatic control, it has been found possible to increase the warper speed from around 80 yd. per minute up to a maximum of 110 yd. per minute, provided other conditions are suitable, including spools of the proper type. Furthermore, the warp produced at this speed is superior in quality to warps produced at slower speeds without the stop motion. This is due, not only to absence of lost ends, but also to the more even tension obtained with drop wires and to the constant speed. Since the warper automatically stops, when a leasing interval or the end of a section is reached, there are no short sections and no misplaced leases.



Recording Thermometer

Mason-Neilan Regulator Co., 1190 Adams St., Boston, Mass., has announced a new recording thermometer featuring a floating coil-clamp, which is designed to reduce friction and thus increase accuracy. The instrument may be equipped with the

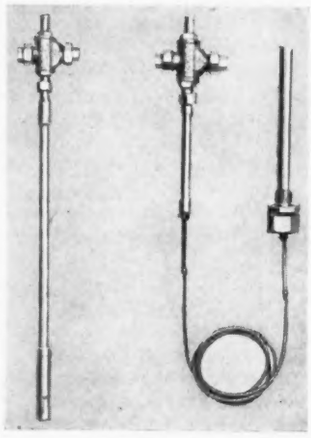


new Over-Heat Protector, a safety feature to protect the thermal element if temperatures exceed the instrument range. It is asserted that, with this new protector, an excess temperature of 500° F. over the chart range will cause no damage.

Temperature Regulator

Two new self-operated temperature regulators are announced by Sarco Co., Inc., 183 Madison Ave., New York. Type KR-15 is intended to control brine temperature in refrigerant coils. The temperature-sensitive bulb is attached rigidly to the valve, and the customary flexible connecting tube is omitted. A feature is the "packless" valve (no stuffing box used) designed to prevent sticking due to frosting. A key is furnished with which to adjust the valve according to desired temperature.

Type TR-20, a junior model



regulator, is designed for use where the standard regulator is too costly. It is recommended for use in connection with humidifying apparatus in textile mills, etc. This regulator has a small bulb, fitted with a union connection and a short length of flexible connecting tube.

Motor Starter

A new line of automatic across-the-line type motor starters designed to prevent accidental starting is announced by Lincoln Electric Co., Cleveland, Ohio. A red "stop" button extending beyond and around a green "start" button makes it virtually impossible to start the motor by unintentionally bumping against the control. Other advantages claimed for the starter include: full advantage of motor's capacity permitted by means of inverse-time-limit protection against overload; low voltage release with two-wire control designed to insure im-

mediate starting upon resumption of current; cadmium-plated mechanical moving parts; cushion action to reduce wear on relay armature; asbestos-compound barrier to eliminate starter surface-creepage between lines; readily accessible internal parts; space-saving down-drop switch; wiping action to prevent pitting and to insure long contact life; outside overload-set to allow case to be locked. The starters are furnished in three types for different voltages and horsepowers.

Rubber-Tired Wheels

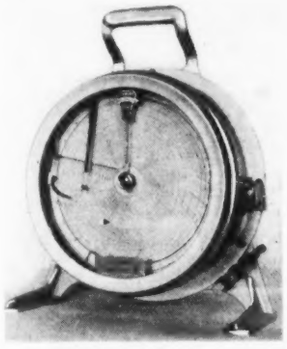
A complete line of rubber-tired industrial wheels is announced by B. F. Goodrich Co., Akron, Ohio. Known as "Vulc-On," the line is available in a large assortment of sizes and types, de-

AND PROCESSES

riving its name from the fact that the rubber tire is vulcanized to the metal wheel by the same process used in manufacture of solid truck tires. Standard cage-type, anti-friction roller bearings and standard lubrication fittings are used in the one-piece metal wheel. The tire is designed not to stretch or roll off. Advantages claimed include easier rolling, lower equipment depreciation, reduced wear and tear on floors, less noise and confusion, and increased handling speed.

Portable Thermometer

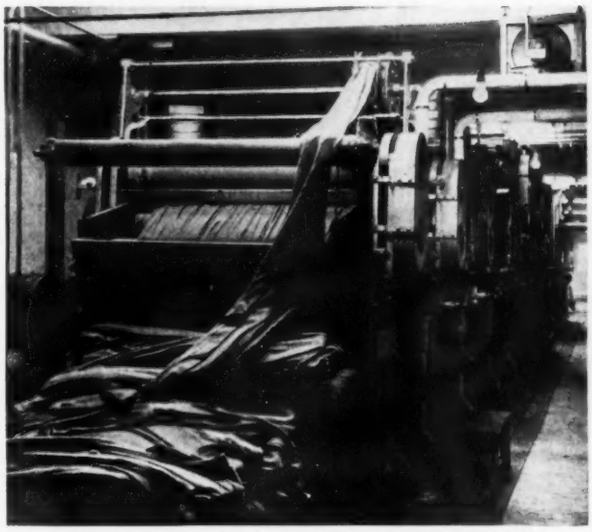
A light weight, well-balanced, portable thermometer, along with a companion instrument for recording pressures, has been developed by Foxboro Co., Foxboro, Mass. The instrument is furnished with either self-contained or long-distance type thermometer in 8- or 10-in. case



sizes. Advantages claimed for the portable thermometer include: chart disk can be removed without use of screwdriver; extreme steadiness of stand prevents tipping over; sliding wedge makes interior quickly accessible; ink bottle and dropper situated in strategic position; handle in line with center of gravity; stand may be removed by unscrewing three bolts, thereby converting portable into permanent instrument.

Improved Unit Heater

Fedders Mfg. Co., Buffalo, N. Y., announces the following improvements in its Series 3 line of unit heaters: electrically welded one-piece cabinets with durable finish; large streamline steam tubes and header tanks with integral baffles to produce even steam distribution; special full-floating mountings to maintain alignment of heating element within cabinet, protect element from piping strains, and eliminate expansion stresses; resilient motor mountings; and patented fins, streamline tubes, and sturdy cabinet, all designed to eliminate resonance, isolate vibration, and insure quiet performance.



Continuous Wool-Goods Washer

A continuous washer, capable of turning out 32-oz., all-shoddy woolen fabrics at a rate of 27 yd. per minute, has been placed on the market by Riggs & Lombard, Inc., foot of Suffolk St., Lowell, Mass. The machine, as now manufactured consists of four wash boxes, five rinse boxes, and an additional tub for addition of any desired treatment, such as starch, etc. The fabric, in rope form, enters the first box over a roll, is run over a reel into the far side of the box, passes through a knock-off device, and then spirals through the nip rolls eleven times. The same process is repeated in each of the four wash boxes, giving a total of 44 nips. Each box is driven by an individual motor. Between the washing and rinsing sections is a working space of 30 in. to allow an operative to get from one side to the other.

The rinsing section consists of five boxes with stainless-steel grids employed to make the divisions, rather than solid partitions. Water flows from the delivery to the entering end. Each box has a pair of nip rolls mounted above the partition and a kick-off reel below the rolls to keep the fabric clear. All five sets of rolls are driven, through silent chains, by a 10-hp. motor of the slip-ring type, which automatically reverses a portion of the cycle, thus moving the fabric back and forth through the rolls and at the same time sloshing it up and down in the tub for better rinsing. The reversing mechanism is electrically controlled and there is a knock-off device in each box to stop the whole machine should a tangle occur or the fabric become tight between rolls.

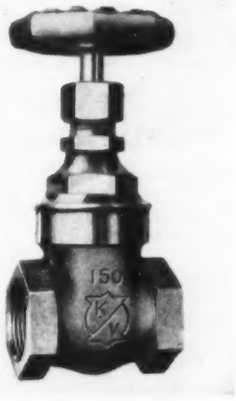
After leaving the machine, the goods fall into a scray and then go through an opener and extractor which run in tandem. The whole range is run by two men.

Card Clothing

To increase the carding action on threads composing reworked stocks, Davis & Furber Machine Co., North Andover, Mass., has developed an improved clothing for workers with sharp teeth which hook into unopened threads, holding them until carded out and reduced to fiber. The clothing is made of a specially constructed wire with an extra strong pitch, which makes it important to set workers not closer to the cylinder than 20 gage, and to set strippers with a 24 gage. A unique type of backing is designed to cooperate with the teeth in opening the stock. Manufacturers call attention to the fact that the clothing removes threads from stock when present in excessive amounts; and, in such cases, unopened threads fill the workers and are stripped out every day. The clothing generally is applied to (1) first two workers of the first breaker card, (2) first two workers of all cylinders, and (3) garnett breast workers. It has a multiply foundation with a rubber face and No. 32 angular wire. The clothing is recommended by the maker for all mills carding cotton, wool, or other reworked stocks.

Bronze Gate Valves

Kennedy Valve Mfg. Co., Elmira, N. Y., has placed on the market a new heavy bronze gate valve designed for 150 lb. steam



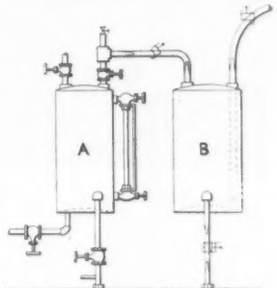
pressure and 250 lb. water, oil, or gas pressure. The valve is similar in design to the regular Kennedy standard bronze gate valve, but is heavier throughout to withstand the higher working pressures. An outstanding feature is the large bonnet-hex placed close to the body to increase rigidity and make easier removal of the bonnet and stem assembly when the valve is installed with close clearances. The stem is made of a special tough bronze and has an unusually large number of heavy contact threads which, with flexible connection between stem head and disk, is said to make stripping of threads difficult and to prolong life of the valve.

Compensated Smoke-Density Recorder

A new photo tube smoke-density recorder has been announced by the Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, Ohio. The recorder is designed to compensate voltage variations and loss of incandescent lamp efficiency by means of a new arrangement of potentiometers and two photo tubes.

Proportioning Feeder for Corrosive Solutions

Development of a corrosive-solution feeder designed primarily for feeding hypochlorite solutions is announced by D. W. Haering & Co., Inc., 3408



Monroe St., Chicago. This unit is extremely simple in construction and is protected against the corrosive action of the chlorine by the use of hard-rubber connections and rubber-lined tanks. Compartment *A* (see accompanying sketch) is filled with an inert chemical fluid (red oil) lighter than the reagent and lighter than the main fluid. The needle-valve control is placed at such a point that it is continually filled with this inert chemical and, consequently, protected from the corrosive action of the reagent. As the main fluid flows through the line, a proportionate portion rises into compartment *A*, forcing the red oil through the needle valve and into compartment *B*, displacing the reagent through a hard-rubber pitot tube into the line. The machine is recharged by shutting off the connections from the pitot tubes and allowing the reagent to flow into compartment *B*, thus forcing the red oil to return into compartment *A* while the main fluid which has risen into compartment *A* is drained and run into the sewer. This operation takes less than 5 min. and the units are made of sufficient capacities to require the operation only at long intervals.

It is stated that the unit is absolutely proportionate and that it will start, stop, and vary in response to flow. With slight modifications it can be adapted for proportioning other corrosive fluids.

Small Electric Brakes

A new line of a.-c. and d.-c. solenoid-operated brakes is announced by Cutler-Hammer, Inc., Milwaukee, Wis. This line

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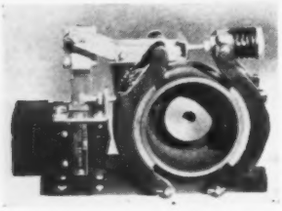
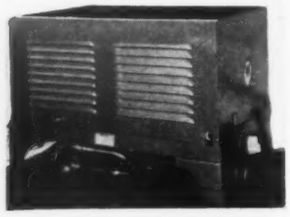


includes three new brake sizes, ranging in torque ratings from 3 to 75 ft.-lb. The brake wheel is relatively large, designed to allow low brake-shoe pressure, which results in less strain on pins and pivot points, longer wear, and use of less current for operation. Molded brake shoe linings are designed to allow 180° braking service. Dimensions of the a.-c. and d.-c. brakes are interchangeable.

Condensing Unit

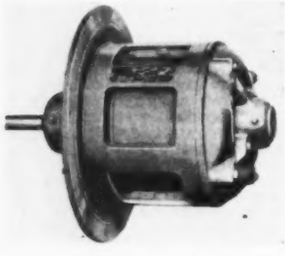
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces two new, 2- and 3-hp., large capacity, open-type con-



densing units which use Freon as a refrigerant. Features include oil pump, oil separator, valves in head, directed flow of air over compressor, and small bore and stroke compressor designed to permit higher speeds with less vibration.

Flanged-Head Motors

Several types of flanged-head mountings have been developed by Louis Allis Co., Milwaukee, Wis., for its line of electric motors. The flange is an integral part of the motor head and may be finished on either or both



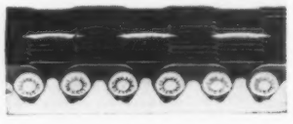
sides. The mounting is designed for use where space limitations make it desirable to eliminate motor feet and to provide for end mounting.

Disconnecting Switches

A line of indoor disconnecting switches, with ratings as high as 1,200 amp. at 5,000 volts, featuring silver-to-silver line-pressure contacts, has been announced by General Electric Co., Switchgear Sales Division, Philadelphia. The silver, applied to the contacts by a special process, is said to produce a surface of unusual wearing qualities and to eliminate troublesome oxidation. Manufacturers state that a test, consisting of 30,000 opening and closing operations, failed to harm the silver contact surfaces. The insulators are made of non-inflammable, arc-resisting Cetec cold-molded material and have a dry flashover of 25 kv.

Modernistic Chain Drive

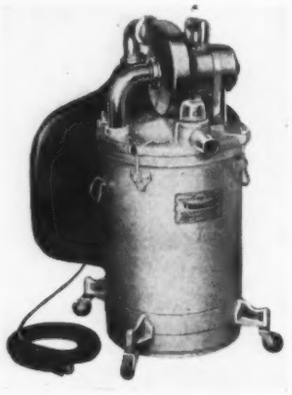
In keeping with the modern trend in machine design, Silverstreak, a silent-chain drive of improved appearance, has



been announced recently by Link Belt Co., Indianapolis, Ind. The chain has been blued and the washers and guide bars treated to give them a silvered appearance.

Vacuum Cleaner

A new light-weight, heavy-duty, industrial vacuum cleaner, known as model 112 Tornado Industrial Vacuum Cleaner, is announced by Breuer Electric Mfg. Co., 852 Blackhawk St., Chicago. The cleaner weighs 45 lb., has a waterlift of 46¼ in., and is operated by a 1-hp. G.E. motor, which may be removed and used as a blower with certain included attachments.



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New Publications

Cotton Opening and Picking, by Gilbert R. Merrill, published by author at 364 Varnum Ave., Lowell, Mass.; 55 loose-leaf sheets bound in red press board; 39 diagrams; $1.75.

The American cotton-textile industry has waited a long time for a textbook all its own. Until now, students and others desiring to learn something of the processes by which cotton yarn is manufactured have had to depend on verbal instruction where available, or on textbooks written and published in England, where both practice and terminology differ considerably from those of this country. Professor Merrill's book, although dealing only with the first two departments of the spinning mill, covers a series of processes which have undergone extensive development in recent years and which would now demand a new textbook even if one were already in existence. We hope, however, that the author will follow this first publication at an early date with others, covering the processes of carding, combing, drawing, roving, spinning, twisting, etc. The manuscript was prepared originally for use in the classes of Lowell Textile Institute where the author is professor of textiles in charge of the Department of Cotton Yarns and Knitting. Therefore it is directed to the novice in cotton manufacturing and is written simply, clearly, and in considerable elementary detail. Unusually clear diagrams show the progress of the stock through the machines. There are portions of the book, however, which will prove of interest to men already somewhat experienced in the work—particularly those chapters devoted to calculations of actual draft, mechanical draft, change gears, machine production, production constants, beater blows per unit of stock, pulley diameters, lap yardage, lap constants, cone-belt settings, etc.

Importance of the Spinning Pump for the Production of Artificial Silk; By J. Van Dartelen: American agent, Engineers Book Shop, 227 Park Ave., New York. Price $2.

This monograph describes the various types of spinning pumps employed in the manufacture of rayon (particularly viscose) and discusses the advantages and disadvantages of pumps now in use. Particular emphasis is placed on a pressure-regulating device invented by the author and designed to insure delivery of a constant quantity of solution per unit of time.

World Resources and Industries; By Erich W. Zimmermann; Harper & Brothers, New York; 842 pages; $5.00.

Comprehensive analysis and discussion of agriculture, mining and the manufacturing industries, and their relation to each other, with the idea of presenting a basis for understanding and interpreting the effect of nationalism and trade restrictions upon our present civilization. One chapter on the geographical and technological aspects of commercial fibers, and another on some economic aspects of fiber production and utilization, will be of specific interest to executives of textile organizations.

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Business Literature

Transmissions. Reeves Pulley Co., Columbus, Ind. Uniquely designed Booklet T-6700 describing variable-speed transmissions.

Vat Dyes. General Dyestuff Corp., 230 5th Ave., New York. Cloth-bound color card showing range of vat dyes printed on cotton piece goods. Includes printing recipes.

Humidity. Foxboro Co., Foxboro, Mass. Bulletin describing recording and controlling instruments for humidity and drying processes.

Processing Machinery. James Hunter Machine Co., North Adams, Mass. July-August issue of *The Hunter Counselor* containing article on replacing equipment.

Oils. E. F. Houghton & Co., 240 W. Somerset St., Philadelphia. August-September issue of *The Houghton Line* containing articles on lubrication, silk throwing, rust stains, etc.

Stainless Steel. Republic Steel Corp., Youngstown, Ohio. Illustrated booklet describing uses of "Enduro" alloys in architectural treatments.

Conveyors. Stephens-Adamson Mfg. Co., Aurora, Ill. Illustrated 16-page catalog describing Redler continuous-flow conveyer and its applications.

Oilless Bearings. Atwood Machine Co., Stonington, Conn. August issue of *Atwood Twists* containing article describing construction of oilless bearings.

Dressing Warps. Davis & Furber Machine Co., North Andover, Mass. Folder describing machinery for "dressing warps from jack spools at 100 yards a minute."

Roving and Spinning. Whitin Machine Works, Whitinsville, Mass. August issue of *The Whitin Review* containing articles on super-draft roving, Casablancas long-draft spinning, and structural improvements in machinery.

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BUSINESS NEWS

Lestershire Spool & Mfg. Co., Johnson City, N. Y., through its president, H. D. Clinton, has announced acquisition of the sole selling rights, in the United States and Canada of Chemung Engineering Corp.'s patented silk and rayon equipment. The Chenco line includes the new Pyrex steaming bobbin described in these columns for September, 1932, and the patented Chenco ball-bearing fingers for twisting or spinning machinery to give positive twist without slippage, described in these columns for August, 1933.

Code Authority for the **Used Textile Machinery and Accessories Distributing Trade** consists of the following: Leon Kimmel, Leon Kimmel Machinery Co., Atlanta; A. J. Matthes, Machinery Liquidating Co., New York; John Rosenstein, Paterson (N. J.) Silk Machinery Exchange; Michael Kerwin, Philadelphia; John Marshall, Fall River. No permanent chairman has yet been appointed. W. J. Parker, 7 East 44th St., New York, will act as secretary and his office will be the authority's headquarters.

J. L. Tucker has recently assumed charge of textile investigations for the industrial materials laboratory of the **Owens-Illinois Glass Co.**, Newark, Ohio.

Sales Factors Corp., New York, has been organized to render a general factoring service for merchants, manufacturers, importers, converters and selling agents of textile and other products. Benedict Erstein, formerly president of L. Erstein & Bro., Inc., and recently vice-president of Commercial Factors Corp., is president of the new corporation, and Ernest C. F. Greeff, for many years a partner in Greeff & Co., secretary and treasurer.

Maj. A. E. Carpenter elected president and general manager of E. F. Houghton & Co., as described in our last issue

Textile World Analyst

STRIKE MAKES FALL OUTLOOK ANYBODY'S GUESS

July Activity Set Two-Year Low: In these days of record-hunting, we presume any kind of a record is better than none at all. July of this year set a two-year low for textile mill activity. It is necessary to go back to July 1932 to find a still lower monthly total of raw material consumed. Naturally, due to the spectacular activity a year previous, July 1934 cut a sorry figure as compared with July 1933—being 42% below. However, as compared with July for the eight-year average 1924-1931, roughly assumed as "normal," July this year was only 15% below that mean . . . The first seven months of this year showed a total activity 14½% below the corresponding period of 1933 and 11½% below the first seven months for the eight-year average 1924-1931.

ENTER the strike! What looked like a fairly clear outlook for a seasonal, and possibly better than seasonal, pick-up in textile business and textile mill activity this fall, has now been temporarily obscured. It is anybody's guess at this writing.

Attempting to estimate the effects of the strike in a purely statistical sense, and without regard to the issues as such, except as they affect its probable duration, it is our hunch that a maximum of a month's serious interference with normal operations in this industry may be anticipated. By this we do not mean that the strike will necessarily be waged at top momentum for a whole month, nor on the other hand that the expiration of that period will necessarily find everything peaceful and lovely. We merely mean that it is unlikely that violent interruption of production schedules can be continued much beyond that length of time.

As to the percentage amount of interference while it lasts, that too is an incalculable factor. The number of union members in the industry as a whole has been variously estimated between 15 and 25%. Added to this, however, are the effects of intimidation, sympathetic action, and crippling of manufacturing departments. It is possible to place a top limit of, say, 50% interference. That, we think, is looking at the situation at its blackest.

The net result of these two estimates would be a maximum of half-curtailment of a normal month's production.

Having said this, we repeat that it is anybody's guess—and this is ours. As it is, we wouldn't go to any great lengths to try to convince anyone of its probable accuracy.

The continuation of the dullness in mill circles during July and August is now history. The spurt in buying interest due to the strike was of only temporary importance, of course, and does not materially influence the fall outlook.

Its effect on prices, however, was tangible. In the cotton division, this combined with the raw material outlook, following the Aug. 8 crop report, to boost manufacturing margins somewhat. It will be noted from Tables I and II that the August average on representative carded fabrics was 16.6c. against 15.5c. in July; and that the August carded yarn margin was 15.3c. against 14.7c. in July.

Raw wool prices, as reflected in TEXTILE WORLD's price index numbers, showed the most decided drop of the year in August, declining eight points. Indicative of the uncertain conditions is the behavior of the top and yarn indices; tops declined only one point from June to July and then dropped nine points from July to August, while yarns slumped eight points from June to July and only one from July to August.

At 141 the raw cotton index (which includes the processing tax) is the highest it has been since October, 1929, the month when the stock market break heralded the depression. Gray cloth moved up in sympathy with cotton.

Passing from textiles specifically to business generally, the outlook is still for improvement during the balance of the year: an improvement which in some lines should be more than seasonal. We find ourself at variance with many observers in that we anticipate the development of a more stable optimism during the fall; and that we believe this optimism will be based upon a more general belief in the soundness of the recovery trend rather than upon expectation of results from any further large-scale injection of artificial measures.

Despite all the untoward and conflicting factors in the immediate situation, we experience what we believe is a non-Pollyanna confidence in the outlook for the fall and winter, at least.

TABLE I. CARDED FABRIC MARGIN

Date	Margin in cents	Date	Margin in cents
July, 1931.....	15.3	August, 1933...	21.4
October, 1931..	13.3	September, 1933	19.5
January, 1932..	12.1	October, 1933...	19.1
June, 1932.....	9.5	November, 1933	17.7
July, 1932.....	9.1	December, 1933	17.6
August, 1932..	11.1	January, 1934..	18.4
September, 1932	13.0	February, 1934.	19.1
October, 1932..	12.6	March, 1934...	18.3
November, 1932	10.7	April, 1934.....	17.6
December, 1932	10.6	May, 1934.....	15.8
January, 1933..	10.4	June 1934.....	15.4
February, 1933.	10.1	July, 1934.....	15.5
March, 1933...	10.2	August, 1934...	16.6
April, 1933.....	11.4	Aug. 8.....	15.7
May, 1933.....	15.6	Aug. 15.....	16.4
June, 1933.....	20.6	Aug. 22.....	17.0
July, 1933.....	23.4	Aug. 29.....	17.5

TABLE II. CARDED YARN MARGIN

Date	Margin in cents	Date	Margin in cents
July, 1931.....	12.6	August, 1933...	23.5
October, 1931..	12.7	September, 1933	21.3
January, 1932..	10.9	October, 1933...	20.0
June, 1932.....	9.9	November, 1933	18.4
July, 1932.....	9.6	December, 1933	18.5
August, 1932..	9.7	January, 1934..	18.3
September,1932	12.8	February, 1934	16.5
October, 1932..	12.3	March, 1934...	16.8
November,1932	11.3	April, 1934.....	15.9
December, 1932	10.9	May, 1934.....	14.3
January, 1933..	10.2	June 1934.....	13.1
February, 1933.	9.4	July, 1934.....	14.7
March, 1933....	9.8	August, 1934...	15.3
April, 1933.....	10.1	Aug. 8.....	14.7
May, 1933.....	12.3	Aug. 15.....	15.4
June, 1933.....	15.4	Aug. 22.....	15.7
July, 1933.....	23.2	Aug. 29.....	15.6

▼ ▼ ▼

Textile World's Price Index Numbers

Date	Cotton Index Numbers				Wool Index Numbers				Silk Index
	Cotton	Yarns	Gray	Colored	Wool	Tops	Yarns	Cloth	Raw Silk
July 31, 1914..	100	100	100	100	100	100	100	100	100
1925, average..	187	188	189	176	223	229	224	233	143
1926, " ..	140	155	157	149	184	189	179	207	136
1927, " ..	140	153	159	153	181	184	187	195	119
1928, " ..	160	162	162	166	199	202	199	197	110
1929, " ..	153	144	145	167	176	179	192	211	108
1930 " ..	108	125	123	144	127	139	161	202	179
1931, " ..	68	93	92	119	99	112	134	161	54
1932, " ..	51	76	73	100	78	97	115	128	34
1933, " ..	84	116	110	113	116	135	139	181	35
Jan. 1934.....	124	151	139	144	153	180	181	222	32
Feb. 1934.....	132	148	146	144	153	180	181	222	34
Mar. 1934.....	132	149	145	142	152	178	180	209	31
Apr. 1934.....	128	144	141	141	147	176	180	209	30
May 1934.....	125	136	132	140	140	166	170	209	27
June 1934.....	132	136	132	140	138	160	169	209	26
July 1934.....	135	148	136	140	138	159	161	209	25
Aug. 1934.....	141	150	136	140	130	150	160	209	25

Note: All cotton indices since Aug. 1, 1933, include processing tax.

TEXTILE WORLD'S

Cotton Digest

ELECTION of W. Ray Bell as president of the Association of Cotton Textile Merchants of New York is gratifying for two reasons. In the first place it is another example of the new idea in association management: namely, the appointment of a full-time executive as president, rather than the election of a man from the industry. Under the present demands on the time of such an official, this new arrangement is found to be much more satisfactory.

In the second place, Mr. Bell has given faithful and constructive effort to the association, and well merits this promotion.

The Association of Cotton Textile Merchants of New York does a great deal of work of extreme value to both selling agents and manufacturers. Much of it is not spectacular, but it is nevertheless vital. Into its accomplishment has gone the untiring service of men like Magruder Dent, the retiring president, whose term has covered a particularly difficult period in the industry.—*Editor.*

Sloan Withdraws Resignation

George A. Sloan has withdrawn his resignation as president of the Cotton-Textile Institute and chairman of the Cotton Textile Code Authority, according to the following statement issued by G. Edward Buxton and Donald Comer, vice-presidents of the institute:

On Aug. 3, George A. Sloan presented his resignation as president of the Cotton-Textile Institute to its executive committee and asked to be relieved at the convenience of the committee. The committee recognized that there were strong and valid personal reasons why Mr. Sloan should ask to be relieved at this time. The eight years of devoted service he had rendered this industry, the terrific load of responsibility and incessant labor he has carried during the last year and a half, and the constructive achievements of the industry under his leadership, made it seem ungracious not to comply with his request immediately. But the very importance of those services made the committee feel it must have time for further consideration.

Since then, urgent representations from the individual units in the industry, small and large, from associated groups, from other industries confronted with similar problems and from those concerned with the public interest, have impressed upon the committee that they were right in their own estimate of the vital importance of the continuance of Mr. Sloan's leadership. The industry is mid-stream in problems of fundamental importance to it, of fundamental importance to the public interest. Only in view of this situation has the committee felt justified in asking Mr. Sloan to withdraw his resignation and in asking him to make the very great personal sacrifices that are involved in his so doing.

The executive committee at its meeting today presented these views to Mr. Sloan. He felt it was a request he could not refuse and he has withdrawn his resignation. This means that Mr. Sloan will continue as president of the institute and as chairman of the Cotton Textile Code Authority.

•

N.A.C.M. Meeting Oct. 10

The National Association of Cotton Manufacturers will hold its annual meeting at the Copley Plaza Hotel, Boston, Wednesday, Oct. 10. The program will cover highlights of current events.

•

Cotton Price Pegged

Another Government loan—pegging the price at 12c.—has been announced by President Roosevelt, despite considerable objection from cotton traders who declare this act will tend to further decrease exports and generally demoralize the trade.

The President stated: "To enable the cotton farmers to market their cotton more nearly as it is required for consumption, rather than necessarliy at picking time, I have requested the R.F.C. to make funds available to the Commodity Credit Corp. that will enable it to increase its lending from 10 to 12c. a lb. on cotton, classing low middling or better which is and has continuously been in the possession of the producer."

Officials maintain that the loan is not a price-fixing scheme, although the effect would be to stop farm sales of cotton if the price drops below 12c. In addition to providing farmers with ready cash, the loan is intended to insure orderly marketing, and prevent dumping in case of a price slump.

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Curtailment Plans Halted

The strike definitely postponed further consideration of plans for curtailment in the cotton textile industry. The 25% program expired Aug. 25. As production had not yet become balanced with consumption, it was realized that some further plan was necessary. It has been suggested that, instead of a 25% reduction for a limited time, a 15% tolerance over the year be adopted for the whole industry, with decision as to use of this tolerance in the hands of the Code Authority. However, any further consideration of this plan is held up until after the strike termination.

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Goods Market Hectic

More than 4,000,000 yd. print cloth were sold at the close of the first week in August, despite a hesitant opening of the cotton goods market. The low crop report, silver nationalization and other factors had a rather bullish effect, though not as pronounced as expected. During the second week, sales of print cloth reached a volume of almost twice current production, and prices on certain staples advanced ¼c. Improvement was not so pronounced in sales of other goods. Large Government awards tended to stimulate the market during the latter part of the month despite general strike threat lurking in the background. September opened with strike difficulties approaching a head, and the market was uncertain.

•

July Operations

Statistics of particular interest to cotton manufacturers, showing July operations and the raw material situation, were:

Spindle activity	74.3% capacity
or	5,151,979,342 spindle hours
Cotton consumed	359,372 bales
Cotton imported for consumption	10,893 bales
Cotton exported (excluding linters)	305,820 bales
1934 crop ginned prior Aug. 16	353,888 bales

June figures for comparison:

Spindle activity	72.7% capacity
or	5,253,454,142 spindle hours
Cotton consumed	363,414 bales
Cotton imported for consumption	9,751 bales
Cotton exported (excluding linters)	459,226 bales

Cotton Crop Estimate

Cotton crop estimate as of Sept. 1 is for 9,252,000 bales, a gain of 157,000 bales since Aug. 1; acreage left for harvest, 27,241,000; ginnings to Sept. 1, 1,397,886 bales.

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Heavy Yarn Shipments

The yarn market started August in a cheerful mood, with a substantial increase in receipt of shipping instructions, but soon became dull. After the Government report was issued, leading distributors advanced asking prices ½ to 1c. lb. Buying on a big scale failed to materialize although small lot orders continued throughout the month. Large scale activity is not expected to start before October. During the latter part of the month, yarn shipments became very heavy as consumers prepared to play safe in event of the U.T.W. strike.

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Such Pleasant Pirates!

The Association of Cotton Textile Merchants of New York recently sent to all members copies of two rather unusual letters typifying the spirit of the market agreement with respect to style piracy. W. Ray Bell, president of the association, offers the following word of explanation concerning the letters:

"Both firms were parties to the agreement. The circumstances were of unusual character, involving samples or drawings submitted by customers with no history attached and ignorance of the offending party. As the occurrences took place several months before our agreement was reached, it was entirely optional with the copying firm whether the prescribed action should be taken or not. For this reason, it is particularly commendable that the second party has voluntarily adopted the approved procedure and relinquished his technical privilege."

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Cotton Industry News

The annual golf tournament of the Carolina Yarn Association will be held at Pinehurst, N. C., Oct. 26 and 27. The committee is also arranging several novel features for those who do not play golf, having tentative plans for trapshooting and other attractions that Pinehurst affords. Invitations will be sent out the last part of September.

Southeastern Cottons, Inc., has been made selling agent for Hannah-Pickett Mill No. 2.

Fred M. Bennett Co. has been appointed selling agent for the Rhodes-Rhyne Mfg. Co., Lincolnton, N. C.

Cone Export and Commission Co. has prepared for the trade a "Directory of Cone-Built Corduroys," containing samples of its various lines of corduroys, with facts about the construction and uses of each. It offers to cutters information on "the right kind of corduroy for every garment you sell." The company states that the directory has had a most enthusiastic reception.

Boshamer & Co., Philadelphia, Pa., have been appointed selling agents for Collins Mfg. Co., Elk Mountain, N. C., which was organized recently to make 8s to 80s carded and combed yarns, spun synthetic yarns, and mixtures. This firm also has been named selling agents for Pisgah Mills, Inc., Brevard, N. C. In addition to the above mills, Boshamer & Co. now represent the following: Caswell Mills, Inc., Kingston, N. C.; Roseboro (N. C.) Mills, Inc.; Pickett Cotton Mills, Inc., High Point, N. C.; Kindley Cotton Mills, Mount Pleasant, N. C.; Rhyne-Houser Mfg. Co,. Cherryville, N. C.; High Point (N. C.) Yarn Mills; and Rhodes-Whitener Mills, Inc., Lincolnton, N. C. Also they are selling agents for the stock dyed single yarns of Pomona Mills, Inc., Greensboro, N. C.

Awnings made for windows and porches are on a list of equipment considered as "built-in" under the regulations of the Federal Housing Administration. A home owner, store keeper or proprietor of a manufacturing plant, who desires to equip his place with awnings, can secure a loan for this purpose at a bank or other accredited financial institution and the loan will be insured by the Government under the National Housing Act.

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Cotton Mill News

Crown Cotton Mills, successor to **Cloverdale Mills, Inc.,** Montgomery, Ala., has incorporated for $10,000. Officers are: Edward J. Hesslein, New York, president; H. B. Dowell, Prattville, vice-president and general manager; T. M. Wells, Montgomery, secretary.

Bradford Mills, Prattville, Ala., have begun construction of a one-story and basement addition, 55x90 ft., for which general contract was let to Batson-Cook Co., West Point, Ga. Cost is estimated at $35,000, with equipment. J. E. Sirrine & Co., Greenville, S. C., are architects and engineers.

Collins Mfg. Co., Elk Mountain, N. C., near Asheville, has been organized to acquire and operate the Martel Mills plant located there, and some equipment has been transferred from Waterford, N. Y., and Columbia, S. C. Approximately 11,000 spindles will be operated on cotton and rayon mixtures, spun viscose and acetate yarns, and mixtures of wool, rabbit hair, and silk.

Hampden Webbing Co., Inc., is being formed to take over Springfield (Mass.) Webbing Co. and **Northeastern Fabrics Co.,** of New York. Equipment is being changed over to manufacture elastic fabric in place of tape and rayon shoulder straps.

Cannon Mills Co., No. 5 unit, Concord, N. C., known as the Franklin Mill, is completing an improvement program including installation of new Saco-Lowell spinning equipment replacing old machinery. Cannon's Unit No. 9 at Concord, has completed construction of a new cotton warehouse, and installed new spinning machinery to replace old.

Wabena Mills, Inc., Lexington, N. C., owned now by **Cayuga Linen & Cotton Mills, Inc.,** Auburn, N. Y., is soon to resume operations under the direction of F. L. Hill. It is understood that new machinery will be installed.

Merco Unit of **Textiles, Inc.,** Lincolnton, N. C., was sold July 28, by A. G. Myers, receiver for Textiles, Inc. Duke Power Co. was the buyer.

Wampun Cotton Mill, Lincolnton, N. C., formerly property of Lincolnton Thread Spinners, Inc., was sold to R. S. Abernethy, Winterhaven, Fla., at a receiver's sale Aug. 6 for $60,000.

Runnymede Corp., Rockingham, N. C., recently organized by F. L. and Yorke Wilson, and associates, has concluded negotiations for acquisition of plant of Midway Mills of Leak, Wall & McRae, Inc.

Springs Cotton Mills, Baldwin plant, Chester, S. C., has installed Barber-Colman spooling and warping, 542 Model X Draper looms, a new cleaning system and individual motors.

D. E. Converse Mills, Glendale, S. C., has installed two Curtis & Marble shearing machines.

Virginia State Penitentiary is planning this fall to set up a cotton mill to weave cloth for ticking, sheeting, clothing, etc., required by inmates of all State institutions.

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Financial News

Pacific Mills reports for the six-month period ending June 30 a net profit, before income taxes, of $889,980, but after all other charges and reserves. The first six months of 1933 showed a net income of $447,486 before income tax but after all other charges.

Pepperell Mfg. Co. reports net earnings for the fiscal year ending June 30 of $1,607,000, and equal to $16.07 per share. The corresponding period of 1933 showed a net of $924,331, equal to $9.24 per share.

Esther Yarn Mills, Shelby, N. C., was adjudged bankrupt last month.

Fontaine Thread Co., Philadelphia, in hands of equity receivers since June 5, 1933, has been returned to its original owners by court order since all claims have been settled or provided for.

Woodside Cotton Mills Co. reported $3,648,107 indebtedness and $4,210,630 assets on applying for reorganization under Section 77B of National Bankruptcy Act.

COTTON IN THIS ISSUE

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TEXTILE WORLD'S

Wool Digest

FOR months, the wool manufacturing industry has been discussing the need for curtailment and has been attempting to devise some program for limiting production which would satisfy at least a majority of the industry. The lack of cohesion in this particular group has been demonstrated anew by the failure to reach this stage of cooperation. Meanwhile, things have gone from bad to worse in so far as the state of business within the industry was concerned; to dwell upon this at length would be to inflict unnecessary pain.

Finally, individual companies have been forced to put into effect individual but radical shut-down or curtailment plans. This effort would have been far more effective if less belated, and if engineered by the industry as a whole. The need for more direct and decisive action in this branch is strikingly apparent.—*Editor.*

Code Jurisdiction on Mixed Goods

The National Recovery Administration has issued a ruling by Division Administrator Robert L. Houston which decides what blankets, piece goods and merino yarns containing both wool and cotton are governed by the cotton textile code, and what are governed by the wool textile code. It follows:

"It is ruled that all blankets up to and including 25% of wool by weight, plus 2% tolerance for manufacturing operations, are governed by the Cotton Textile Code. All other blankets containing both wool and cotton are governed by the Wool Textile Code.

"All piece goods, up to and including 25% of wool by weight, plus a manufacturing tolerance of 2%, are governed by the Cotton Textile Code. All other piece goods, containing both wool and cotton, are governed by the Wool Textile Code.

"All merino yarns, up to and including 45% of wool by weight, when spun on the cotton system, are governed by the Cotton Textile Code. Mixed yarns spun on the cotton system, containing an excess of 45% of wool by weight and all mixed yarns spun on any other system are governed by the Wool Textile Code."

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"Synthetic Wool" Gets on Front Page

"Synthetic Wool" occupied considerable space in daily newspapers around Aug. 29 as result of a despatch from Germany. One paper headlined "Nazis Produce Synthetic Wool to Wear Against Hard Winter"; another "'Woolstra' Clothing Worn in Reich as Wool Imports Drop." Richard Dillenz, director of the Reich Institute of Fashion, apparently was the source of the publicity on Woolstra. From all that can be learned from the despatches, this is a synthetic staple fiber, best used for apparel when mixed with shoddy. With wool imports restricted by edict there is no wonder that use of staple fiber in Germany should expand. We mentioned the rising interest in this material in Germany and Japan on page 107 of TEXTILE WORLD for July. There is no evidence so far that the German material is anything really new.

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Tropicals Start Season in Mixed Situation

Lines of tropicals for summer, 1935, were priced in the latter part of August and then because of the strike threat most prices were withdrawn early in September. Standard 9 oz. fabrics were priced at $1.30 and $1.37½. Other lines ranged from 80c. for manipulated lines to $1.55 for 11 oz. The American Woolen Co. prices were reported to be 10 to 12% under last year. Makers are hopeful of a good season despite competition of cotton and linen fabrics for men's summer wear. The standard two-ply tropicals have been steady, but considerable competition developed in the single filled group.

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Dull Trade Closes Large Mills for Two Weeks

Announcement was made on Aug. 21 by the American Woolen Co. that on Sept. 7 it would close its four Lawrence, Mass., mills for two weeks and that other mills of the company would follow the same plan depending on orders on their books. Dull business was given as the reason for the shutdown. Many other mills curtailed during August because of scant business. This situation brings back talk of organized curtailment, with perhaps limitation to a single 40-hour shift, though chance of such enactment is still small.

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Wool Goods Outlook Improves

The strike situation in early September promised to aid in balancing production of wool goods and to give opportunity to move stock goods more favorably than anticipated. There has been fair demand for cheap lines, women's wear coatings at 85c. to $1.00 being an active range. There was some call for "tree bark" fabrics at $1.50 to $1.65. As a whole, fall retailing has started slowly and that sluggishness has colored the attitude of fabric buyers in covering ahead. Last year there was a tendency to buy more goods than needed as they were regarded to be a good speculation; this year users seem willing to remain short of the market except for goods to go into immediate use.

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Moisture Regain for Sales Yarn

Objections to or suggestions concerning proposed modification of the rules of practice for the sales yarn division of the wool textile industry may be filed with NRA up to Sept. 14. The modification would fix the moisture regain percentages at which shipments, against orders on or after April 30, 1934, should be billed as follows:

Yarn spun of wool and/or similar animal fibers only—French spun, 15%; Bradford spun, 13%.

Worsted yarns containing silk and/or rayon either by mix, blend or twist, French or Bradford, 12%.

Worsted yarns containing cotton, either by blend, mix or twist, French or Bradford, 11%.

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Wools Are Waiting

Extreme conservatism characterizes the wool situation. Topmakers continue to buy a little wool. Manufacturers look over the market but withhold purchasing. "It is a condition of stalemate all around," say merchants. The markdown in wool of 10% at the beginning of August was merely a tardy recognition of the fact that wool had for too long a period been maintained close to the high of the 1933 upturn.

Now that the wool level is well below that of a year ago, a sounder basis has been provided on which it is hoped the wool industry can build up business. During the last two months manufacturers and topmakers have bought practically no wool and yet at a minimum estimate 25,000,000 to 30,000,000 lbs. have gone into consumption. Everything seems to hinge on favorable reaction in the goods market and continuance of a firm situation in foreign centers. Wool buying awaits cloth buying. Brisbane sale prices, reported in the latter half of August, indicated

strengthening after the break at the London auctions just previous.

Wool tops were quiet through August without marked price movement. Spots were at 87c. on Aug. 3 and 83c. on Aug. 31.

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Quarterly Wool Stock Report Resumed

Bureau of the Census in cooperation with code authorities has resumed issuance of a quarterly wool stock report which was discontinued in 1930. The June 30, 1934, figures were issued on Aug. 15. They cover 294 dealers, 20 topmakers and 396 manufacturers. In clean equivalent the dealers held 110,753,000 lb. (excluding carpet wools) and the topmakers and manufacturers held 57,963,000. A total of 31,348,000 lb. of top and 14,913,000 lb. of noil were also reported.

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Activity of Industry

Current statistics on wool consumption and mill activity follow, the activity percentage being based on single 40 hour shift, 5½ days per week:

Wool consumed:	June	July
Total clean equiv. (excluding carpet)	8,275,000	8,846,000
Carpet wool (grease)	8,205,000	5,810,000
Looms (50" wider)..	68.6%	67.0%
Carpet looms	57.4%	41.1%
Combs	49.9%	46.2%
Worsted spindles ...	35.9%	38.1%
Woolen spindles	91.5%	91.3%

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Plan Complete Yarn Report

The National Association of Wool Manufacturers has under compilation a detailed report covering worsted yarns in which production figures are to be gathered, not merely from sales yarn spindles but all spindles known to be under the Code. Contracts and shipments are to be reported weekly by those concerns that sell yarns and through these reports it will be possible to record shipments to jobbers, manufacturers, and other sales yarn spinners as well as the yarns spun for sale, own use, and on commission. Inventory figures on a 4-4-5 weekly basis will be requested of all mills with spindles, which it is held, will preclude possibility of unreported stock being suddenly offered for sale.

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Proposed to Prevent Pirating of Weaves

Protection against pirates of weave patterns would be afforded members of the piece goods selling division of the wool textile industry by an addition to the code's rules of practice and merchandising submitted to the NRA for approval by the Sub-Code Authority. Objections or suggestions must be made prior to Sept. 15 to Deputy Administrator Coonley, Washington, D. C.

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Wool Industry Briefs

The Code Authority for the piece goods selling division of the wool textile industry has applied for revision of its rules of practice and merchandising to make special provision for sales of automobile fabrics. This would include a uniform sales contract, uniform terms of sale, and strict regulation of refusals and cancellations.

At the election conducted by the Cleveland Regional Labor Board at Cleveland (Ohio) Worsted Mills Co. on Aug. 15, 1,208 out of 1,735 employes voted for the so-called company union to represent them in collective bargaining. The 384 workers at the Ravenna plant voted 296 to 88 in favor of the U.T.W. organization.

"Mediterranean Blue," a new shade similar to cornflower, has been worn lately on the Riviera in a complete dinner suit or in trousers worn with mess jacket.

D. H. Grant & Co., New York, have added a line of woolens to their established lines of cotton fabrics.

Imitation Persian lamb skin is being made in England. The fabric has a cotton back so finished as to give the appearance of a natural pelt and provide adhesion of a fine mohair or artificial silk chenille yarn applied in such a way as to copy the wavy and winding characteristic of the natural hair. A machine has been invented by J. W. Driver, of Shipley, Yorkshire, which will produce 80 yd. of 48-in. material per day.

The 1934-35 wool clip in South Africa is officially estimated at 245,000,000 lb., according to a cable reecived in the Foreign Agricultural Service of the Bureau of Agricultural Economics. This is the smallest clip in nine years. Last year's clip was 270,000,000 lb., compared with record production of 316,300,000 lb. in 1932-33. Available supply is enlarged somewhat by a carryover in local ports of nearly 30,000,000 lb.

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Woolen Mill News

Bigelow-Sanford Carpet Co., Thompsonville, Conn., suffered extensive loss July 31 when fire, originating in a generator, broke out in one section of the plant. Most of the factory was closed down for a week following the fire.

Mayo Woolen Co., Millbury, Mass., resumed operation last month after a shutdown of 18 months. A. F. Jealous, of Wellesley Hills, is president and general manager of the new operating company; Bernard Goldfine, Boston, is treasurer; John Warnke, formerly of Webster Mills, superintendent.

Plymouth (Mich.) Felt Products Co., Inc., recently organized with capital of $25,000, has taken over former plant of Trenton Fiber Products Co., Inc.

Mohawk Carpet Mills, Amsterdam, N. Y., reports a net profit of $240,004 in its semi-annual statement.

Angorino Woolen Mills, Eugene, Ore., are making mattresses and sleeping bags from the shorter wool of the Angora rabbit. Charles Hathaway, president of the firm, states the long wool is being made into yarn.

Dornan Carpet & Rug Co., Inc., Philadelphia, Pa., operating **Monitor Carpet Mills,** has taken title to a group of three-, four- and five-story factory buildings at Oxford and Howard Sts., and will remodel for plant units.

William H. Horstmann Co., Philadelphia, Pa., has let general contract to William J. Wallace for alterations and improvements in mill, and work will be placed under way at once.

Pennsylvania Carpet Corp., Philadelphia, Pa. Machinery and equipment at this mill was sold in various lots at a public sale on Aug. 23, for a total of $135,000. Bidding for the looms was active, buyers including Canadian and English interests.

Brickner Woolen Mills Co., Sheboygan Falls, Wis., idle for some time past, has been taken over by new interests, headed by Raymond E. Nelson, Faribault, Minn., and will be modernized. Mill will specialize in mackinaw cloth.

Kenwood Mills, Ltd., Arnprior, Ont., are replacing the present one-story dyehouse section by a two-story structure to provide more dyehouse space, as well as a larger office.

Botany Dryspinners Regd., Kincardine, Ont., have completed the installation of a considerable number of additional spinning machines in the new mill building erected late last year. Drawing, spinning, and twisting machines were purchased from Prince-Smith & Stells Ltd., of Keighley, Eng., while electric motors, cone winders, humidifiers, top-dyeing and such equipment were made in Canada and the United States.

TEXTILE WORLD'S

Rayon Digest

THE "Battle of the Fibers" is not a misnomer in so far as the silk and rayon divisions are concerned. It is becoming increasingly evident that this relationship is a fight without gloves.

Synthetic-fiber producers are viewing the situation more realistically than they did. They don't talk so much about silk being "out." They realize that, even if the poundage consumed has been reduced, its price fluctuations can have a vital effect upon the synthetic market. There is also less of a tendency to under-estimate the competition that exists between the two.

All this fact-facing is so much to the good. It lends added interest to the two promotional programs in prospect or under way. Although, as indicated previously in these columns, we believe they will eventually bring new dollars into the textile industry, we do not think the promoters should have any illusions as to the status of their respective products.—*Editor.*

Campaign Plan Waits Producers' Last Word

Details of the rayon promotional campaign, which was approved some time ago by the National Rayon Weavers Association, continued in abeyance at the opening of September, the whole future of the plan awaiting official action by the yarn producers. Leading factors in the yarn industry indicated clearly their belief that the producers would approve of the project and would take the necessary steps to raise funds "in excess of $300,000," thus paralleling the sum pledged by the weavers.

While the growing interest in silk incident to the "Silk Parade" has stimulated a desire on the part of the rayon trade to get their own drive under way quickly, some rayon factors insist that the campaign will not be, in any sense, a counter-movement to the silk promotion. These spokesmen point out that the rayon drive has been contemplated for nearly a year—long before there was any definite idea of a silk campaign. The present delay of the producers in acting on the plan as approved by the weavers, has been due to vacation absences; it is expected therefore that definite action will be taken during the current month.

•

200 Denier Lively In Listless Month

Interest in 200 denier yarn for the heavier winter fabrics continued to be a major feature of the rayon market through August; two foremost producers were booked to capacity on this yarn to the end of September and other firms were in a somewhat similar situation though still taking orders. In other viscose yarns, the demand was very light; indeed, August call as a whole was well below last year and stocks in rayon plants rose slightly during the month. Weaving mills were plentifully supplied with dull taffetas which situation caused a pronounced lull in the call for dull-luster 150s; the bright 150s moved fairly well.

Underwear knitters enjoyed a comparatively good business in late July and they placed numerous yarn orders of some size in August. However, this total was not big and it could not counterbalance the prevailing disposition of weavers to restrict their commitments. Producers of yarn expect some of their weaver-customers to pass up the fall season and to go right into manufacture of spring lines; such action, it is believed, would bring a pick-up in yarn movement late this month. Yarn prices have held steady despite the lull, and there is no immediate prospect of any general change in levels. In contrast to the quiet situation in viscose yarn, was the activity which marked the acetate field. Some firms reported spirited call for numerous acetates.

•

Europe Sees Staple As Cotton's Rival

Development of rayon staple fiber in Europe and Japan has been so pronounced that some leading factors now regard this fiber as rival to raw cotton, especially the longer staple types, such as Egyptian, according to advices received from the TEXTILE WORLD'S British correspondent. The progress made with staple in Great Britain indicates that the fiber is destined to become much more important than hitherto. Courtaulds, Ltd., claim to have increased the wet strength of the fiber 30% and the result has been a decidedly more favorable market for staple among cotton spinners and weavers; indeed, rayon staple prices in Britain are becoming steadily more competitive with cotton.

In Germany where frozen credits have stimulated all synthetic yarn production, staple is receiving unusual attention, and plans are being perfected for its production on a large scale. While Japan's interest in staple is known, the degree of development there is not yet fully appreciated; at present Japan has an installed capacity of 40,000,000 lb. annually and many more plants for staple production are being erected or planned. Summarizing the outlook for staple in Europe and Japan, the correspondent concludes: "It is conceivable that within a short time staple fiber will become as important as continuous filament rayon which will mean a doubling of the proportion of man-made fibers in consumption."

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Rayon May Become Sole German Textile

Federal stimulation of the use of rayon in Germany promises before long to make that country a world leader in rayon market development, according to current reports. The scarcity of textile raw materials, which has been acute in Germany, since cotton, wool, and silk all are imported, has attracted the attention of the German Government and a plan to make rayon virtually the only German textile has been developed. U. S. Consul J. F. Huddleston, Dresden, reported Aug. 22 to the Department of Commerce, that indications point to a rayon boom in that country shortly. Recently the German government cooperated with rayon producers in extensive propaganda to foster "home consumption of home rayon," which drive took on a strong nationalistic tinge since its fundamental aim was to make Germany increasingly independent of foreign textiles. In line with this plan, the government has formed a sales syndicate to control rayon output and a first result has been to raise rayon merchandise prices above American levels.

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Resume Federal Hearings Sept. 17

The Federal Trade Commission made known in Washington Aug. 29 that the Commission's investigation into charges of monopolistic practices, etc., against certain rayon yarn producing firms would be resumed in New York City on Sept. 17. It was understood the hearings would be held in the Post Office Building.

•

Colors Must Glitter

Brilliancy of color promises to be unusually important in winter rayon fabrics, especially in velvets, satins, moires and failles. Notable among the

shades highlighted at the recent Paris openings were a lustrous violet, deep blues, bold greens and a new gunmetal shade. Black-and-white combinations continued important, but there was also a wide range of autumn browns and wine tones, in most of which brilliance was an outstanding characteristic. "Color played an exceedingly important role at Paris this year," reports the DuPont Style Service.

•

Tubize Knitting Mill Reopens

John E. Bassill, president, Tubize Chatillon Corp., on Sept. 10 confirmed reports that the strike in the firm's tubular knit fabric mill at Hopewell, Va., had been settled; he said the knitting department which employs 200, would resume operations within a week.

While market observers continued during August to speculate on the possibility that the Tubize Chatillon Corp. might reopen its nitrocellulose plant at Hopewell, Va., it was learned in authoritative sources that nothing short of a sensational rise in the demand for and in the price of rayon would cause the company to reverse its original plan for a permanent closing. Meanwhile the striking employees held an election under the auspices of the National Labor Board and voted two to one in favor of being represented by the United Textile Workers of America as against the Tricity Protective Association, which they said was a company union. The Labor Board later affirmed the election, but the whole proceeding appeared as somewhat of an empty victory since the yarn plant remained closed.

•

Suggests Standard Tests

Standardization of breaking-strength tests for rayon yarns is recommended by Dr. Irving J. Saxl, research director, Waypoyset Mfg. Co., Pawtucket, R. I., writing in the September issue of *Textile Research*. Dr. Saxl bases his proposed system, which he outlines in detail, on the hypothesis that the esential thing to determine is whether or not too great a percentage of the given lot has a breaking strength less than a prescribed minimum.

•

A New Aspect of an Old Problem

A new angle to the long-mooted rayon nomenclature issue developed in August when it became clear, as the "Silk Parade" plan developed, that this campaign was emphasizing "genuineness" as a keynote. Store merchandisers who have long employed the term "synthetic yarn" in preference to the world "rayon" for man-made fabrics, said the stress on genuineness—which incidentally is also manifesting itself in other non-textile industries—made them hesitant to use the word "synthetic" in describing rayon merchandise. These executives claimed that the word "synthetic" is interpreted by many people to indicate "just as good" or "substitute" and that therefore it could conceivably hurt rayon sales in the store.

•

Cotton-Mill Waste Used as Base for Rayon

Development of a method for utilizing cotton-mill waste as a raw material for rayon is described by Yonekichi Uno, president, the *Textile Review* (Japan), in a recent issue of that publication. Lack of a domestic source of supply for wood pulp led the Dai-Nippon Cotton Spinning Co., to experiment with cotton wastes, such as fly, oily cotton, and floor sweeps. This waste is purified by boiling with waste caustic liquors from rayon mills, bleached, and converted into viscose yarn. Yarn made from this material is said to be 20 to 30% stronger than that made from wood pulp. The total amount of cotton-mill waste produced in Japan is estimated at 6000 tons a month, or sufficient to yield a minimum of 2,400 tons of purified cotton. To supplement this, it is suggested in the original article that short-staple cotton could be grown in Manchuria and Chosen.

•

Industry Briefs

Dull crepes with a bright satin reverse are among the distinctive new rayon novelties which Paris has sponsored for winter, according to the August issue of "Crown News," published by the Viscose Co. The same issue also describes that company's promotional display at the recent convention of the American Home Economics Association in New York.

Bemberg yarn has come into the volume division of the lining field through its use in the new "Barrister" linings which have been introduced by Wm. Skinner & Sons. The linings consist of a lining twill, serge for body linings and a sleeve lining. Spirited demand is reported.

A series of decorative fabrics for fall made of DuPont rayon has been arranged by Witcombe-McGeachin & Co. for a buyer's handbook. A curtain material made of Acele is included. Among the decorative fabrics are plain, moired and embroidered Toile de Rae and plain and moired Cord de Rae and Soleil Raie. The book is being sent to 1,000 store buyers of decorative fabrics.

•

Rayon Mill News

Du Pont Rayon Co., Waynesboro, Va., has been increasing the number of men engaged on its construction work. Next month over 1,000 men will be on the company's payrolls. The unit itself is progressing, with the steel work in place and the outside masonry about completed.

Dominion Rayon Weaving Co., Ltd., Toronto, Ont., has leased the buildings of the former Dominion Motors at Leaside, near that city, and will move all of its manufacturing equipment to the new plant about the end of September. Considerable new machinery will be purchased.

Canadian Celanese, Ltd., Drummondville, Que., is considering an expansion program involving installation of additional equipment for considerable increase in present capacity. New units are planned. Company is arranging financing to total at least $3,000,000, a large part of which is to be used for project noted.

Rayon Processing Co. of R. I., Central Falls, R. I., has developed a number of improvements in methods of producing cotton and rayon flocks and other novelty fibers and is seeking patent protection on its inventions. One development involves cutting cotton into flocks of various predetermined uniform lengths and so treating the flocks that they sift readily without felting or matting. Another involves a means for controlling the softness or harshness of a surface coated with rayon flocks. The company has installed equipment for cutting cellophane and other cellulose films into short or continuous lengths.

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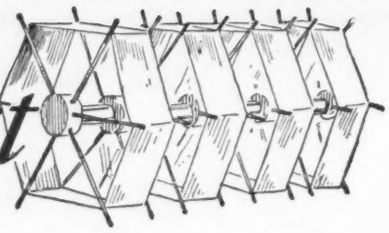
TEXTILE WORLD'S

Silk Digest



THE silk industry has started something which every branch of textile manufacture should do. It has voted to appoint a committee to make a thorough study of its code of fair competition with a view to correcting any faults that have developed since it went into operation last October. The plan includes the intention to make such code revisions as the review shows to be necessary.

Probably no one type of effort is more constructive than this. Most of the codes have been put together hastily and under pressure; they cannot possibly be perfect. Why carry on with provisions which may be either harmful or ineffective?

Just one word of warning, however: Extreme care should be exercised in the appointment of the committee. If the personnel is anti-NRA, merely a destructive document will be forthcoming; if it is dominated by code-makers with undue pride in their child, the report will be a white-wash. Somehow or other—and we know it is difficult—an objective approach must be made. If it is, the results will be of extreme value.—*Editor.*

"Silk Parade" Marching

Heralded by a blaze of publicity and promotional activity in which both the silk divisions of the textile trade and the distributing outlets cooperated, "The Silk Parade" started its cross-country march on Monday, Sept. 10. As scheduled the first week was devoted to the metropolitan area of New York, and the second week beginning Sept. 17 was given over to a nation-wide observance. As early as mid-August most of the leading stores both of New York and elsewhere had completed plans for silk displays and had extended their lines of silk merchandise to meet the expected demand. Posters advertising the event were hung prominently in salesrooms of broadsilk manufacturers and all related divisions.

Displays of historic silk apparel and other merchandise were a feature; other outstanding aspects of the drive were advertising campaigns, radio talks, movies and silk fashion shows. Retailers in New York reported before the "Silk Parade" started, that the call for silk in piece goods and other merchandise had been noticeably accelerated. The event is in charge of the International Silk Guild of New York.

•

Curtailment Ordered Then Suspended

As result of exemptions granted mills in the Paterson, N. J. district which it was stated gave that branch an unfair advantage, an order for curtailment of production issued Aug. 18 by the Silk Textile Code Authority and effective Aug. 24, was suspended on Aug. 27. The original order called for a four-day weekly operation of production equipment from Aug. 24 to Sept. 28 incl., specifying that the operating days be limited to Monday, Tuesday, Wednesday and Thursday. This would have been the second broadsilk curtailment this year, and aimed at reducing the surplus stocks which had brought some price weakening in the industry.

Peter Van Horn, chairman of the code authority, cited four reasons for suspension of the curtailment order: First, improvement in the stock situation since issuance of the order; second, increased spot buying; third, increased output of competitive textiles; and fourth, the granting by the NRA of exemption from the order to 17 firms representing 40 mills in the Paterson district. Max M. Baker, secretary of the Silk Manufacturers Association of Paterson, and representative of the code authority there, asked the code authority to exempt that group, and when the authority declined, took the matter to Washington where he obtained the desired exemption. Stating that Mr. Baker had unwarrantedly gone over the head of the authority, Mr. Van Horn announced Aug. 26 that Mr. Baker had been dismissed from his code authority post. This was the second break of the month between Paterson and the code authority, J. J. Kehoe, labor mediator for the authority in Paterson having resigned Aug. 17 due to differences with Mr. Van Horn over policy.

While market opinion in the broadsilk industry on this rapid-fire sequence of developments had not fully crystallized at press-time, several viewpoints were expressed. Chief of these perhaps was the conviction that, in view of the Paterson exemption, the code authority could not do other than suspend the order. The comment credited unofficially to certain NRA officials at Washington that the curtailment order had been "precipitate" in that it did not allow the industry sufficient time to rearrange production schedules also found considerable endorsement among broadsilk weavers. These critics pointed out that, while they thoroughly approved of curtailment in principle, they felt it was equally vital that adequate notice of such steps be given to mills in advance.

It was reported Aug. 28 that the NRA was considering revocation of the clause in the silk code authorizing the code authority to order 90-day curtailments. NRA officials felt dissatisfied with the way this privilege is being used by the code authority, it was stated.

•

Code Changes Asked

Amendments to the silk textile code governing labor hours, selling terms, reports from mills and trade practices, have been approved by the code authority and will be submitted to the NRA, it was announced last month by Peter Van Horn, chairman of the code authority. Mr. Van Horn said the NRA would be asked to set an early date for a hearing on the proposed changes.

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Federation Moves To Larger Quarters

After ten years' stay at 468 Fourth avenue, New York, the National Federation of Textiles, Inc., formerly the Silk Association of America, pulled up stakes on Sept. 1, and moved uptown to 10 East 40th st. The new location was decided upon as a compromise since it is about equal distance from the Seventh ave. district and from the lower Madison ave. area. The Federation occupies the entire 14th floor, approximately 10,000 feet at this address. This increased space permits concentration on one floor of various offices which occupied four floors at the old address.

The Federation celebrated its removal by distributing the first issue of a new publication, "Progress Bulletin." This 12-page periodical, which will appear monthly, is a journal of silk industry news and Federation announcements; Peter Van Horn is editor.

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Silk Plays Tricks 13/15s Firm, 22s Drop

Raw silk presented a Jekyll-Hyde picture during the month, with Crack Double Extra 13/15 white 78% holding fairly steady, while sharp declines were registered in the yellow 22s. Pressure for turnover on domestic stocks was blamed for the weakness in yellows; this softness carried through the latter part of August and on Aug. 24, leading importers admitted they were selling these 22s at less than a dollar a pound, but refused to say how much less; quotations

put these numbers at $1.05 and thereabouts.

Little immediate improvement is expected, the raw market pinning its main hopes on the "Silk Parade" which may help toward a firmer basis in October. Certain important hosiery firms have cleared their stocks and have placed a moderate quantity of spot business on raw silk. Generally, however, demand was light to the point of being negligible in both weaving and knitting divisions.

•

July Deliveries Show Slight Decline

Silk deliveries in August showed a slight gain from those of July according to figures made public by the National Federation of Textiles, Inc. Key comparative statistics for three months follow:

	June	July	August
Imports	31,057	39,241	28,673
Approx. Deliveries	33,069	32,021	36,247
Warehouses (End of month)	59,048	66,268	58,694

Federation figures on loom operations for the four weeks ended July 14 showed the average number of looms used per shift to be 17,576 and total loom hours 1,222,074. Employment statistics placed the average number of employees for this period at 21,949.

•

Wage Differential Basis Announced

Announcement of the official basis for determining the wage differential in the silk industry was made public last month by Howard Heydon, vice-chairman of the Silk Code Authority, who at the same time filed the differential basis with the NRA at Washington. The procedure of calculation follows:

The method is to determine the dollar difference between the regular weekly wage paid to the lowest paid class or occupational group of employees on July 1, 1933, and the Code minimum rate of $13 in the North and $12 in the South, per week of 40 hours of labor. This amount of difference shall then be added to the regular wage received for a full week's work as of July 1, 1933, by each of the higher paid classes or occupational groups of employees. The total shall constitute the Code minimum wage of each of the respective classes or occupational groups of employees. An example of how this is worked out is shown in the following:

	July 1, 1933 Wage Received for Full Week	Plus the Differential Amount	Code Minimum 40 Hr. Week	Code Minimum Per Hour
Lowest paid class..	$8	$5	$13	32½c
Higher paid class..	12	5	17	42½c
Higher paid class..	15	5	20	50c

•

Velvets Hold Lead In Sluggish Market

Continued spirited call for pile fabrics and hesitancy regarding cantons and other staples were the chief features of the broadsilk market in the weeks immediately preceding Labor Day. Approach of the "Silk Parade" stimulated confidence among stores with the result that piece goods buyers were actively inquiring about all lines.

The demand for velvets has been maintained healthily for several weeks and prospects point to continued movement of these lines.

•

Strike Spurs Sales, Prices Withdrawn

A decisive increase in demand and the withdrawal of prices by numerous mills, was the first reaction of the broadsilk industry to the inclusion of that division in the cotton textile strike. While the strike in broadsilk mills was ordered during Labor Day week-end by F. J. Gorman, chairman of the strike committee of the United Textile Workers of America, conferences looking to an adjustment were proceeding during the subsequent week between Peter Van Horn, chairman of the silk textile code authority and the strike leaders.

•

California Exchange Open to World Silks

Inclusion of a silk trading exchange for raw silk from all world markets in the new California Commodity Exchange which opened Sept. 4 at San Francisco has raised the question in New York as to whether this may not cause a change of policy on the part of the New York Commodity Exchange.

•

Industry Briefs

The Duplan Silk Corp.'s unbroken record of increased profits through depression years has been continued, according to figures for the year ended May 31, 1934, which show a net of $659,654 against $485,947 in the same period the year preceding.

Ward Cheney, chairman of the Velvet Industry Code Authority, announced Aug. 19 that the N.R.A. had approved rules for registering velvet fabric designs thus protecting these patterns in the same manner that silk designs are protected.

Camay Silk Mills, Bangor, Pa., claims a record for fast underwear manufacture. This firm transformed silk yarn into ready-to-sell glove silk underwear in six days which time included the winding, warping, weaving and dyeing.

Velvet was highlighted as a winter millinery fabric at a millinery fashion show held at the Waldorf-Astoria Hotel, New York, last month, under auspices of the Trade Development Committee of the Millinery Industry.

Douglas Walker, of Douglas Walker & Co., New York, resigned Aug. 29, as secretary of the International Silk Guild. He said his action had no political significance, as the post was just nominal. Miss E. Herrell has been appointed active secretary.

Plans for a general convention of the silk industry to be held in New York, came up for discussion by the code authority at a meeting held Aug. 24, and it was decided to postpone the matter indefinitely.

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Silk Mill News

Middletown (Conn.) **Silk Co.**, operated by M. Bornstein & Sons, New York, N. Y., will be dismantled at early date and machinery removed to plant of Consolidated Silk Mills, Ltd., St. Hyacinthe, Que., operated by the same interests. Middletown mill is listed as operating 96 looms. It is said that 50 looms have already been moved.

Phoenix Silk Mfg. Co., New York, is in process of reorganization under Section 77B of the National Bankruptcy Act. Evan W. Walters has been appointed permanent trustee.

U. L. Timerson, Lepin Stone and associates, of Trumansburg, N. Y., have plans in progress to establish and operate a silk mill in that town. A building has been acquired in which machinery and equipment will be installed. The plant will employ from 40 to 50 workers.

J. G. Wolfe Silk Co., Paterson, N. J., has acquired former plant of the **Grittman Throwing Co.**, Danville, Pa., and will remove its business and equipment from Paterson immediately.

Magnes Bros., and **Herman Spector**, operating silk mills in Paterson, N. J., are removing their respective plants from New Jersey to Trumansburg, N.Y., where larger and more commodious quarters have been acquired. The two plants will resume operations in Trumansburg late in September. The firms will merge, giving a total of about 130 looms.

E. H. Kluge Weaving Co., West New York, N. J.—Two-story mill of this company has been sold by Oscar L. Aufderheide and Edmund G. Stalter, receivers, to Russell Murray, West New York, for a reported consideration of $25,000. New owner is reported planning occupancy for similar line of manufacture.

Silk Industries of Canada, Ltd., Acton Vale, Que., is planning new one-story addition to cost over $60,000, with equipment.

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TEXTILE WORLD'S

Knit Goods Digest

THE establishment of a formula for a wholesale price differential on underwear, applicable to manufacturers selling to both wholesalers and retailers, is a step forward.

This problem has always been a fertile source of trouble. The fact that manufacturers and wholesalers got together and agreed upon a basis is another example of the new method of developing fair trade practices. These matters are always controversial and consequently always require compromise. But, if two fair-minded groups get together, a settlement can be effected which can be relied upon to result in more mutually satisfactory conditions than previously obtained.—*Editor.*

Strike Upsets Peaceful Hosiery Outlook

Confirmation of the renewal of the 1934 agreement with the American Federation of Full-Fashioned Hosiery Workers for the ensuing year reached members of the Full-Fashioned Hosiery Manufacturers of America, Inc., on Aug. 29. It was stated that no important changes had been made in the contract. The 1934 agreement expired Aug. 31.

Prospects for continued peace in the hosiery industry were badly upset in the non-union mill division, where the American Federation of Full-Fashioned Hosiery Workers, Philadelphia, had called a strike for Sept. 12 in all mills which did not have any contractual relations with the union. The Full-Fashioned Hosiery Association, composed of non-union mills, met in Philadelphia early last month and adopted a resolution opposing any reduction in wages. Mills which are members of the association confirmed this decision, pledging themselves to maintain the minimum wage scale now in effect. Charges made Aug. 23 by the federation that the Ajax Hosiery Mills was pressing company union leaders to propose a wage cut were emphatically denied by Stanton D. Sanson, president of Ajax, who pointed out that his firm is a member of the Full-Fashioned Hosiery Association and would maintain scales as favored by that body. In late August prospects pointed also to renewal of the 1934 contract between the hosiery federation and the Phoenix and Holeproof companies of Milwaukee.

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Defer Spring Openings

Because of instability of raw material costs and market conditions generally, the spring 1935 lines of lightweight underwear will open later than usual this year. The Lightweight Knit Underwear Group of the Underwear Institute at a meeting Aug. 16 voted to defer the showings until after Sept. 10. Members reported, however, that the outlook was promising and that forward orders have reached the inquiry stage.

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Hosiery Sales Rise, Prices Are Skittish

Increased demand which was evident in the hosiery market at the end of August was partially offset by persistent reports of price weakness. Numerous manufacturers who had followed the recommendation made by John H. Brine, president of the National Association of Hosiery Manufacturers, to join in a voluntary curtailment plan, and had shut down their mills, have since reopened. As these manufacturers had stated that they would not reopen until prices strengthened, the market interpreted the reopening as a sign of firmer levels. However, actual observation contradicted this belief; there has been plenty of under-selling in the New York market, and—what disturbed manufacturers particularly—this even extended to the three-carrier hosiery. It is not thought that the price weakness will continue, however, as increased fall buying is due this month; furthermore, retail stocks are believed to be below normal for this period.

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Constantine Praises Mills' Wage Showing

Reviewing the report of the hosiery Code Authority's field staff on code compliance, Earl Constantine, executive director of the Code Authority, on Aug. 22, warmly praised the industry for its showing. The report covered the field staff's first complete tour of inspection in the industry. Pointing out that the industry in its entirety totals 145,000 workers, with an annual payroll of about $120,000,000, Mr. Constantine said the underpayment of $46,280.26 to 1,698 employees, as shown in the report, "is exceedingly small in proportion and will compare very favorably with any other industry operating under the N.R.A."

Of the total of payments which fell below wage minimums specified in the hosiery code, $29,663.19 had been paid back to employes by Aug. 16 and the remainder, $16,617.07 was in process of being paid. The field staff found that 180 mills had failed to pay proper wages in one or more cases, most of these omissions having been due, investigators reported, to misunderstanding of the code provisions.

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Fall Underwear Sales Only Fair

Ribbed underwear bookings for fall delivery were only fair up to the first week of September, and mill agents were hoping for a decisive pick-up at the first hint of snappy weather. Firms selling direct to stores complained that the retailers had placed considerably less than their normal volume for the coming season; however, knitters were confident that these distributors would be pressing them for merchandise very soon. The sale of lightweights has been best in the vests and pants division, and mills expected these numbers to continue important late into winter. Construction has been given unusual stress by buyers of lightweights, it was noted, and in line with this trend design will probably be a major influence in selling lightweights for the remainder of the season.

•

Return Engagement

The executives of knitting mills in Rockford, Ill., have organized the Rockford Yarn Consumers' Circle, of which William Ziock, Sr., was elected president. Recently, the new organization was host to the Chicago Yarn Men's Circle at a golf and dinner party given in Rockford, Ill., and Madison, Wis.

•

Compromise Effected in N. Y. Strike

The knitted outerwear strike which closed nearly 200 mills in the New York Metropolitan area Aug. 7 appeared to have reached its end the last week of August when spokesmen for both sides approved a compromise agreement drafted by Raymond V. Ingersoll, as arbiter. Official approval was voted by the manufacturers at a meeting Aug. 27. The agreement extends for two years, and provides for a 36-hour week for the first year and a 35-hour week for the second year. The wage scale follows: $49 for knitting mechanics, $29 for machine knitters and $40 for hand knitters. This scale is half-way between the demands of the International Ladies Garment Workers Union and the United

Textile Workers, representing strikers, and those allowed by the Metropolitan Knitter Textile Association representing the manufacturers.

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RFC Hosiery Banker

Loans aggregating $344,700 have been advanced by the Reconstruction Finance Corp. to three hosiery companies in the Chattanooga, Tenn., district, it became known Aug. 19. Funds from the loans which were obtained by the Textile Mortgage Corp., Chas. A. Noone, president, of Chattanooga, went to W. B. Davis & Son, Inc., the Graysville Hosiery Mills and the Aycock Hosiery Mills.

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Mill-less "Knitters" Must Change Names

Use of the word "knitting" in the style names of wholesalers who are not actually manufacturers is challenged in a new drive instituted by the Knitted Outerwear Code Authority. The Code Authority has sent out a letter to all wholesale outerwear firms which employ either "knitting" or "knitting mills" in their style names and do not engage in manufacture of merchandise; the letter points out that such use of the term "knitting" is in violation of the code. It is stated that this practice by wholesalers works injustice to mills selling direct to retailers and the authority will prosecute those refusing to change.

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Industry Briefs

Numerous hosiery manufacturers have rearranged their promotional plans to tie in with the possibilities of "The Silk Parade" in the merchandising of silk hosiery.

Earl Constantine, executive director of the hosiery code authority, who spent August on a tour of southern mills, stated in High Point, N. C., late last month that his observations showed general need of curtailment, though he also looked for a seasonal upturn this fall.

P. H. Hanes, of the P. H. Hanes Knitting Co., has been appointed representative of the Underwear Institute to serve on the carded yarn spinners' sub-committee of the cotton textile industry.

The appointment of Edward A. Brandwein as assistant secretary of the National Knitted Outerwear Association is announced.

A promotional method employed by Holeproof Hosiery Co. which dramatizes hosiery's position in the ensemble for men's wear through use of a "color wheel" showing all items of outer apparel in color, has resulted in adding 116 new store accounts, it is announced.

The second terrapin derby sponsored by the athletic association of Mock-Judson-Voehringer Co., full-fashioned hosiery manufacturers, Greensboro, N. C., took place Saturday, Sept. 1, on a specially arranged track at the plant. The derby was limited to 100 entries; each one was numbered, named and placed in the race by employees.

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Knitting Mill News

Richart Hosiery Mills, Inc., Camden, N. J., has been organized with capital of 100 shares of stock, no par value, to operate a knitting mill. Company is represented by H. M. Mendell, 333 Arch St., Camden.

Myrtle Knitting Co., Brooklyn, N. Y., is planning to transfer its knitting business to the plant of the Unionville (Conn.) Mfg. Co. The two plants will be merged. The latter firm spins yarns on woolen system with 17 sets and 7,000 spindles. The Brooklyn company operates 45 latch needle and 15 flat knitting machines on men's and boys' sweaters.

Ford Mfg. Co., Waterford, N. Y., has voted approval of a $150,000 loan from the Reconstruction Finance Corp. for expansion.

Ruth Hosiery Mills, Inc., Durham, N. C., has been incorporated with authorized capital stock of $50,000 and subscribed stock of $400, to engage in manufacture of yarns and hosiery of all kinds. Incorporators: J. C. Berry, Robert L. Lee and W. J. Berry, all of Durham, N. C.

Bogle & Watkins, Inc., Greensboro, N. C., recently organized to operate a hosiery mill, have awarded general contract to the Angle-Blackford Co., Greensboro, for new plant on South Elm St. Initial plant will consist of main three-story mill unit, 60x100 ft., one-story dye house, 40x40 ft., and one-story boiler house adjoining, 30x30 ft. Equipment will be installed for employment of about 300 persons. It is proposed to have the mill ready for service by end of the year. Cost is close to $150,000, with machinery. George Bogle is president, and Allen H. Watkins, secretary.

Bales Hosiery Corp., High Point, N. C., recently organized with capital of $100,000, plans operation of local mill. It is understood that production will be started in a leased property. New company is headed by N. W. and M. L. Bales, Thomasville, N. C., and N. C. English, High Point.

Sentinel Mills, Inc., a new hosiery mill at High Point, N. C., began operations with 50 operatives around Aug. 15. Infants' and children's hosiery are manufactured.

Schafer Hosiery Mills, Mount Airy, N. C., hosiery manufacturers, has opened with ten operatives. Men's hosiery is manufactured and sold direct to the finishing plants of the Renfro Hosiery Mills.

B. G. Brumby, Marietta, Ga., is setting up a knitting mill at Murphy, N. C. W. M. Fain is owner of the building. Local business men have subscribed necessary funds.

Art-Tee Knitting Mills, Philadelphia, has sold part interest to B. Charles Gould formerly sales director of Worcester Knitting Co.

Carity Hosiery Co., Philadelphia, has moved its full-fashioned hosiery mill from 7 North 3rd St. to 179 West Allegheny Ave.

Puritan Knitting Mills, Philadelphia, Pa., have taken over a plant at Altoona, Pa., and will remodel for use as branch mill. It is proposed to install equipment for about 200 operatives. Plant is scheduled to be ready late in the fall.

Honus Wagner Co., Pittsburgh, Pa., manufacturer of athletic and sporting goods, is planning a new knitting mill division for the production of athletic knitwear. Two floors of present plant will be given over to new department, with installation of a battery of knitting machines and auxiliary equipment. Initial employment will be about 40 persons.

O. V. B. Knitting Mills, Inc., Spring City, Tenn., have been incorporated with capitalization of $25,000. Incorporators are Joseph A. Sizer, Harry T. Burns and Otho V. Burn.

Regal Silk Hosiery & Knitting Mills, Inc., Petersburg, Va., newly organized, is expected to be in operation within 90 days. Arthur K. Deal is president; John E. Green secretary and treasurer; E. D. Lucas, counsel. The company will manufacture full-fashioned silk hosiery, employing about 75 persons at the start. Nine knitting machines will be put into operation. Authorized capital is $50,000 and stock is being sold locally.

Inspiration Hosiery Mills, Inc., Wytheville, Va., will install 12 additional knitting machines.

Regent Knitting Mills, Ltd., Toronto, Canada, report gross operating profits of $180,537 for the first six months of 1934, compared with $86,937 for similar period in 1933. Net profit was $87,125 as against $2,277.

Westminster Hosiery, Ltd., Guelph, Ont., is arranging for removal of plant to Toronto, Ont., where it will be consolidated with the mill of **Weldrest Hosiery, Ltd.,** Mount Dennis district, an affiliated organization. Increased production will be carried out at the latter plant.

Broulac Knitting Co. has begun production in its plant in Garthby, Que. The company will make a full line of men's half hose.

TEXTILE WORLD'S

Processing Digest

SOME months ago we had occasion to comment on the apparent lack of initiative shown by wool finishers, as contrasted to cotton finishers, particularly in the direction of improving fabrics through the finish—and of promoting such products. We suggested some of the more important lines along which progress might be made.

It is encouraging to report that this branch of the textile industry seems to be more conscious, today, of the need for such effort. One of the most recent indications was the announcement that Shelton Looms, in conjunction with the New Hampshire Fire Insurance Co., would issue five-year certificates of guarantee against moth damage on all its mohair fabrics for furniture. This reflects a high type of alertness.

Nor is this an isolated case. Our technical department is receiving an increasing number of inquiries from wool finishers for data on the production of unshrinkable finishes on wool, on the production of dark shades which reflect infra-red rays, on waterproofing, and on a variety of other new trends. All this reflects a new spirit of progressiveness.—*Editor.*

Silk Dye Workers Demand Contract Changes

The issue between the Institute of Dyers & Printers representing employers and the Federated Silk & Rayon Dyers & Finishers of America, A.F. of L. affiliate, representing workers, regarding a closed shop, wage increases and other demands, became clear-cut on Aug. 24 when the union officially asked for revision of the agreement which will expire Oct. 24. In its letter which complied with the contract clause requiring 60-day notice of contemplated changes, the union asked for a 30-hour week, a 20% raise in wages, and a closed shop.

One of the most significant demands is that the new contract contains a clause requiring that "the employer agrees to employ only members in good standing of the Federation." The union claims that it represents the majority of the 15,000 dye workers in the Paterson district.

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Appeals Board Exempts Acme

The N.R.A.'s new policy of affording relief to small concerns found its first specific application Aug. 21, when the recently created Industrial Appeals Board held that the Acme Finishing Co., Pawtucket, R. I., was entitled to continued exemption from the 25% curtailment order under which the cotton textile industry had been operating. The board thus reversed the ruling of Deputy Administrator Prentiss Coonley. The exemption was temporary as the curtailment order expired Aug. 25. The exemption applied to three printing machines only; subsequently Mr. Coonley stated that similar relief would be granted other finishing firms operating not more than three printing machines in each plant.

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Propose Shrinkage Test for Silk and Rayon Fabrics

The following tentative standard method for the determination of shrinkage in silk and rayon broad goods has been proposed by the National Federation of Textiles, Inc.

Sample—The area tested shall be 10x10 in., with a 1-in. margin, each test sample to be cut individually to a 12x12 dimension. No part of the area measured for test shall be taken from within 2 in. from the selvage. The part measured shall be outlined by marking with indelible ink or by a thread sewn into the cloth.

Method of Washing—The sample shall be treated in the Launder-Ometer, in 300 c.c. of a 0.5% neutral soap solution, for 15 min. at a temperature of 100° F. Remove from the jar and rinse by dipping in water at 100° F. (do not squeeze). Place in the jar with 300 c.c. of fresh water and rinse for 5 min. at 100° F. Remove from the machine and without squeezing lay on a flat tray, or other flat surface, and keep in a horizontal position until the great excess of water has evaporated. Wrinkles can be removed by laying the sample on a stone slab and pressing with the palm of the hand.

Method of Pressing—The samples shall be pressed while still appreciably damp in a Flat-press (G. E. Flatplate Ironer or similar is satisfactory) at a temperature between 275 and 300° F., being careful to press only long enough to remove the moisture.

Condition 2 hr. or longer at ordinary atmospheric conditions.

Measure each side of each piece at three places—at the middle and at each end. Average all measurements for each dimension.

Report shrinkage in warp and filling in percentage of original 10 in. dimension.

Unless there are valid objections to some features of this method, it will be shortly offered to the American Society for Testing Materials for inclusion as a tentative method of that organization.

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Approve Processors 16-Group Set-up

Amendments to the code of the textile processing industry providing for the setting up of 16 divisions have been approved by the N.R.A. Each division will set up rules of procedure and trade practice for its own administration. The 16 divisions created under the approved amendments follow: cotton yarn dyers and bleachers, cotton yarn glazers, cotton yarn mercerizers, cotton and wool yarn winders, warpers and slashers, rayon yarn dyers, rayon yarn general converters, rayon yarn straight twisters, novelty yarn twisters, rayon yarn winders, warpers, slashers and beamers, woolen and worsted yarn dyers, woolen and worsted woven piece goods dyers and finishers, woolen and worsted knitted piece goods dyers and finishers, cotton and rayon tubular knit goods dyers and finishers, raw stock and top dyers, hosiery dyers and hosiery finishers.

Among other amendments also approved was one providing that every member of the industry shall file with an agency of the code authority prior to Nov. 5 a complete inventory of his productive machinery and equipment.

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Colorful Fabric Mode Predicted for This Fall

Outside of the usual volume orders for black and a strong market for browns, indications are for a more colorful fall season than in many years, according to Thelma Roberts, fashion promotion director, Chicago Wholesale Market Council. The following chart, prepared by Miss Roberts, is a forecast of fall color groups for women's apparel based on reports from Paris openings and other fashion sources:

Color	Fashion Position	Color Percentage	Tones Included:
Black	1st	31.56	.....
Brown	2d	27.37	mahogany, red brown, grayed browns
Green	3d	9.83	onyx, emerald, poison, olive, gray green, vert green, blue and yellow green.
Red	4th	8.14	cardinal, scarlet, blackberry, plum, wines.
Blue	5th	5.55	navy, peacock, regatta, aqua, sapphire, royal, stratosphere, purple blue, pale blue, gray blue.
White	6th	4.06	in luxury or trimming fabrics
Gray	7th	3.36	mauve, oxford, elephant, dove gray, taupe.
Purple	8th	3.20	amethyst, royal purple, aubergine, reddish violet, fuchsia.
Rust	9th	2.61	henna, tile.
Pink	10th	1.70	cerise, raspberry, pale pink, geranium
Yellow	11th	1.44	gold
Beige	12th	1.18	grege.

A.A.T.C.C. Notes

Papers bearing on textile problems related to viscose, acetate, and cuprammonium rayons, will feature the symposium of the rayon sub-committee of the American Association of Textile Chemists & Colorists at the annual meeting of that organization, to be held in December. Among speakers will be Dr. J. B. Quig. of DuPont Rayon Co.; Dr. Harold DeWitt Smith, of A. M. Tenney Associates; and H. Benzing, of American Bemberg Corp. Dr. J. F. X. Harold will be chairman.

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New Dyestuffs

E. I. du Pont de Nemours & Co., Inc., announces the following three new products:

Diagen Red AMX, Diagen Red AR, and Diagen Scarlet AR, stabilized azoic dyestuffs intended primarily for printing large patterns on cotton and rayon fabrics; they possess good all-round fastness properties.

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Water-Repelling Compound

A new water-repelling compound which is said to be insoluble in water and therefore to permit production of permanent water-repellent finishes on textiles is announced by Simcoe Mfg. Co., 430 Race St., Philadelphia. The manufacturer states that the compound, which has an oil base, permeates all the fibers of the cloth and imparts a water-repellency which is not destroyed upon washing of the fabric. Marketed under the trade name, Protexall, the product may be applied by brushing or spraying; on a coating machine; or by passing the goods through a bath of it. Protexall is colorless and practically odorless. It is stated, further, that textiles treated with the compound can be laundered with little difficulty, as it does not close the pores of the fabric.

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Announces Bleaching Process for Bast Fibers

Development of a new process for bleaching retted or green flax, jute, hemp, and other bast fibers has been announced recently by Arthur S. Roberts, Lowell, N. C. According to the inventor, this process permits bleaching to be carried out on the usual types of raw stock or yarn dyeing equipment constructed of cast iron, copper, brass, wood, etc. In pressure or vacuum raw stock machines, the time required is said to be about 4 hr.; in open yarn dyeing machines, 6 hours.

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Fall Color Card Issued

Two new groups of colors, "Faded Leaves" and "The Cocktail Hour" are the features of the 1934 fall season color card just issued by the Textile Color Card Association of America. The "Faded Leaves" Group leans to autumn shades, being mostly browns, golds, and maroons; "The Cocktail Hour" group includes gay reds, blues, and greens.

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Emulsifying Agent

A new emulsifying compound, Emulphor E1, has been announced recently by General Dyestuff Corp., 230 Fifth Ave., New York. This product, which is an oily liquid at ordinary temperatures, takes the place of the older Emulphor 0 for emulsifying liquid fatty acids, mineral and vegetable oils, waxes, organic solvents, etc. The product is suitable for use at ordinary room temperatures; higher temperatures are not recommended.

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Industry Briefs

The rayon and silk dyeing and printing industry, in response to a poll conducted by the Code Authority for that industry, has decided by a vote of 62 to 36 to disapprove the plan for settling claims through the central claims and adjustment bureau of the code authority. The questionnaire was sent out to 104 firms and six refused to vote.

Application for approval of the budget and basis of contributions for the rayon and silk dyeing and printing industry was filed with the NRA by the code authority of that industry on Aug. 23. The budget for the period of July 1, 1934 to Dec. 31 1934 is $67,830, and the proposed basis of contribution is ⅛ of 1% of the gross volume of business (sales of services) for the calendar year 1933. For firms processing products of their own looms, the basis of contribution is ¼ of 1% of that portion of the payrolls devoted to the dyeing, finishing and otherwise processing of its own products for the year 1933.

An amendment to the code for the cotton textile industry, approved last month alters the definition of piece dyeing machines as "productive machinery" by inserting the words: "piece dyeing machinues where the same are used in production of unprinted fabrics." The industry had explained that in cases where a fabric after being dyed in the piece is to be printed, the piece dyeing machine no longer remains the productive machinery.

PROCESSING IN THIS ISSUE

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Processing Plant News

Pepperell Mfg. Co., Lindale (Ga.) unit, is constructing a new dye house. The job is under contract to Batson-Cook & Co., West Point, Ga. The new building is to be of reinforced concrete. The first floor has been completed.

Hamilton Piece Dye Works, Paterson, N. J., are seeking reorganization under Section 77A and 77B of the Natonal Bankruptcy Act.

Imhoff-Paillard Piece Dye Works, Inc., Paterson, N. J., has been organized with capital of $125,000, to operate a dye and finishing mill at 15 First Ave. New company, which will specialize on pure-dye silks and synthetics, is headed by Allan G. Winters and Julian A. Paillard, Paterson. David S. Herman, 45 Church St., Paterson, is company representative.

Madison Piece Dye Works Corp., Paterson, N. J., recently organized by Charles Rosenberg, Paterson, and associates, plans operation of local dyeing and finishing plant. New company is represented by Emanuel Shavick, 140 Market St., Paterson, attorney.

Hygrade Dye Works, Long Island City, N. Y., finishers of hosiery, are seeking reorganization under Section 77B of the National Bankrupcty Act.

DeLuxe Hosiery Dye Works, 422 East 53d St., New York, has been formed by B. M. Plann (who will supervise outside operations), Julius Lukas (who will have charge of dyeing) and H. D. Davis (who wll have charge of finishing and packing).

Rockland Finishing Co., West Haverstraw, N. Y., former plant of this company, consisting of group of 36 mill units on 15-acre tract of land, has been purchased by the Garnersville (N. Y.) Holding Co., recently formed by local interests, and will be remodeled and improved for leasing as individual units.

Keystone Dyeing Co., Philadelphia, Pa., has acquired a one-story plant on Amber St., near Allegheny Ave., and will occupy for expansion. Improvements will be made in structure.

McCauley Dye Works Co., Philadelphia, Pa., is being organized and incorporated to engage in the general dyeing of textiles. Edwin P. Loughran, 2035 Land Title Bldg., Philadelphia, represents the concern.

Rock Hill (S. C.) **Printing & Finishing Co.** has purchased from J. W. Anderson Co., Inc., a steel warehouse, with 50,000 sq.ft. floor space, to be used for storage purposes.

TEXTILE WORLD'S

Engineering Digest

THE value of having key members of the operating staff attend expositions where textile equipment is displayed is well recognized. Unfortunately, through their preoccupation with strictly textile matters, executives do not as readily discern the advantage of encouraging heads of the power and mechanical departments to attend *their* exposition. And this despite the fact that engineering advancements frequently offer an opportunity for substantial savings in textile mills. All of which is merely a reminder that the Eleventh Annual Exposition of Power and Mechanical Engineering will take place at Grand Central Palace, New York, Dec. 3 to 8, and that the annual meeting of the American Society of Mechanical Engineers will also take place that week. It is not too early for executives to give thought to the matter and, where practical, to arrange for the attendance of the right man or men.—*Editor.*

Taking Care of Peak Demands for Live Steam

In plants that have large finishing departments using considerable quantities of live steam, the demand for such steam is likely to come in intermittent peaks. One chief engineer found difficulty in meeting this demand and maintaining the required steam pressure. When the heavy demand came, the increased supply of feed-water to the boilers lowered the pressure and decreased the output.

The plan was then adopted of carrying a high water level in the boilers just previous to the coming of the peak load, which time is generally known. When the increased demand for steam came, the boilers were thus supplied with an ample reserve of water heated to the temperature of the steam, and for a short time the usual rate of feed to the boilers would not have to be increased. This interval gave the fireman an opportunity to increase his drafts and coal feed to meet the increased load, and the full steam pressure was easily maintained. C. L.

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This Textile Mill Tested Its Lubricating Oil

"There is no question that lubricating oils are undergoing improvement," an industrial engineer recently declared. "To keep up with the march of progress it is wise continually to keep tabs on lubricating oils as well as on nearly everything else in the mill."

He cited the following example of the service which may be expected from a modern oil:

In a certain textile mill there is a 1,500 kw., direct-connected steam turbine. The oil used by this turbine was in continual use for approximately ten months. Samples were then taken from the reservoir and tested. Standard samples of new oil of the same make were also tested in the same way. The tests compare as follows:

	Used Oil	New Oil
Baume	28.1°	28°
Color	4	3
Viscosity at 100°	172 secs.	167 secs.
Flash	380° F.	390° F.
Fire	430° F.	440° F.

These results are remarkable because the change in the oil is so small as to be almost negligible. The oil is only slightly darker in color than the new oil, and the viscosity is practically the same. Ten degrees lower in flash and fire certainly will not detract from the lubricating qualities of the oil.

On examining the sample for sediment after 168 hours settling period, it was found that the sample had not deposited any sediment and that the sample held no sediment or impurities in suspension.

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Production Gains Through Better Lighting

Some actual cases where production has been increased by better illumination are reported by L. A. S. Wood, manager lighting division, Westinghouse Electric & Mfg. Co. Mr. Wood prefaces his remarks by stating that, at present, industrial lighting averages five foot-candles, one survey of 2,000 plants even showing an average below three, whereas:

"The development of the light meter, which is a portable compact means of measuring lighting intensities, makes it possible to check easily and accurately the intensity of light provided by artificial illumination in industrial plants everywhere. Illumination research laboratories have discovered, by actual test, that wherever eyes are used for work that ten foot-candles is an absolute minimum. Further tests have also revealed that working under intensities less than ten foot-candles causes not only severe eye-strain but results in fatigue, sleepiness, nervousness, headaches, indigestion, etc. Glare from light sources in the line of vision, reflections from glossy surfaces and uneven distribution of light are also features which contribute to this condition."

The following was among the test cases cited by Mr. Wood:

"In a hosiery plant, proper illumination was installed and immediately production of knitting machines jumped 10.8% and of looping machines 6.1%. The cost of the installation was only 0.4% and the operating cost 0.1% of the yearly payroll."

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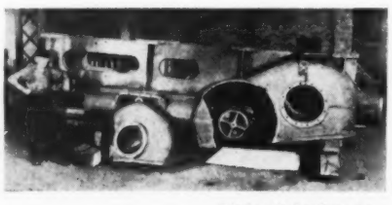
Safety Congress in Cleveland Oct. 1 to 5

With 'Let's Tell the World About Safety" as their battle cry and official slogan, some 6,000 to 8,000 delegates will convene in Cleveland, Ohio, Oct. 1 to 5 for the Twenty-Third Annual Safety Congress and Exposition. The official program shows a total of 120 sessions and more than 350 speakers. Separate programs have been prepared for almost every branch of industry. The Textile Section will meet at the Carter Hotel.

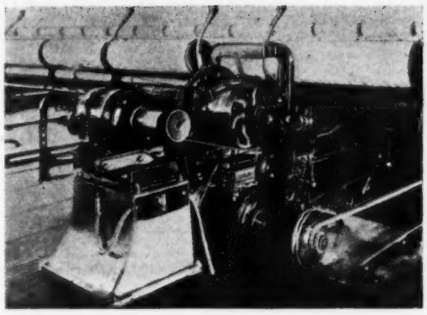
Following the résumé of year's activities by General Chairman Charles H. Eames, at the first session on Oct. 2, there will be a talk on relation of accident prevention to production by H. B. Spencer, Mishawaka (Ind.) Rubber & Woolen Mfg. Co. A new safety code for cotton mills will be offered by Charles Forsaith, superintendent Jackson Mills, Nashau (N. H.) Mfg. Co. Another speaker will cover accident prevention from the viewpoint of an industrial executive.

At the Oct. 4 session there will be a talk on "How We Maintain Interest in Safety in Our Mills," by R. S. Payne, Director of Engineering, Cluett, Peabody & Co., Inc., Troy, N. Y. Safety in rayon manufacturing will be analyzed by N. E. Goode, safety director, American Enka Corp., Enka, N. C.



Linde Air Products Co.

A ten-ton casting for a pump which suffered a bad break in the manufacturing process. The damage was repaired by bronze-welding at a cost of about 6% of replacement value. In all there was about 12 ft. of welding on material 1 in. thick.



Ware Woolen Adopts Pivoted Motor

Ware Woolen Mills, Ware, Mass., is preparing to install thirteen Rockwood-type drives on its mules, following six months of successful operation of one such drive installed as an experiment. The pioneer drive involved a Rockwood base with special arms holding a 3-hp., 1200-r.p.m., squirrel-cage motor. The base was mounted on a special pattern and stand. The original flat belt at present gives no indication of wear. Although the installation was made without the approval of the mule manufacturer, who felt it would not operate satisfactorily, the decision of the mill with respect to making a large installation is proof that the drive is meeting requirements.

The superintendent of the plant lists the following thirteen advantages of this short-center flat-belt drive over the customary lineshaft and belting:

1. Less spring on shipper arm and back lever.
2. Makes shifting belt easier.
3. More uniform speed.
4. Mule strike is evener.
5. Mule draw is faster.
6. Power off at doffing.
7. Power off in event machine breaks down or is not in operation.
8. Less danger to operator.
9. No main drive or counter belts.
10. No damage to material from oil drippage.
11. Less power consumed (ten 3-hp. motors do work formerly done by 35-hp. motor).
12. 5 to 7% less slippage.
13. 16% increase in production of machine.

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Engineering Trade News

American Lumber & Treating Corp., Chicago, which is now operating Wolmanizing plants at Crossett and Fordyce, Ark., treating lumber and other forest products produced by Crossett Lumber Co. and Fordyce Lumber Co., also has plants under construction at Franklin, Va., and Wauna, Ore., to treat products, respectively, of the Camp Mfg. Co. and the Crossett Western Lumber Co. In addition to these plants, a number of commercial wood treating plants in various parts of the country are using the Wolman Salts treatment, including the Wood Preserving Corp., Pittsburgh, Pa. The American Lumber & Treating Co. represents the association together of several industrial and financial interests, including the Aluminum Co. of America and Chicago Bridge & Iron Works.

Link-Belt Co., Chicago, announces several new appointments in its positive drive division: G. H. Burkholder, formerly of Philadelphia, is appointed western sales manager. W. H. Kinkead has been made manager of sales of Link-Belt speed reducers, with headquarters in Philadelphia. G. L. Gansz succeeds Mr. Kinkead, and will henceforth be responsible for Philadelphia office sales of the positive drive division.

Stephens-Adamson Mfg. Co., conveyors, Aurora, Ill., announces that **L. S. Stephens** has been elected to succeed **D. B. Piersen** as president. Mr. Piersen, one of the founders of the firm in 1901, was made chairman of the board upon the resignation of W. W. Stephens of Pasadena, Calif. L. S. Stephens, the new president, has been active in the firm since 1914.

Stonard Co., Philadelphia, manufacturers of maintenance materials, has opened a southern office at 552 Murphy Ave., S.W., Atlanta, Ga. W. E. Woodrow will be in charge of office. State representatives are: A. H. Zirhut, North Carolina, headquarters at Charlotte; S. V. Shevlin, South Carolina, headquarters at Newberry; G. H. Stauffer, Tennessee, headquarters at Chattanooga.

Bancroft Belting Co., Boston, has appointed Ernest F. Culbreath, Ninety Six, S. C., as southern representative.

Allis-Chalmers Mfg. Co., Brown Instrument Co., Charlotte Electric Repair Co., Detroit Stoker Co., and **Ric-Wil Co.** will be represented by Wm. W. Moore, who is opening sales offices at 714 West Trade St., Charlotte, N. C. Mr. Moore was formerly manager of the Charlotte branch of Allis-Chalmers Mfg. Co.

D. W. Haering & Co., Inc., Chicago, manufacturers of H-O-H water treatments and proportioning units, have appointed D. D. Morey, formerly of Morey & Morey, Dallas, Tex., as district manager in charge of the New York office at 1451 Broadway.

ENGINEERING IN THIS ISSUE

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Engineering Mill News

Ballston-Stillwater (N. Y.) **Knitting Co.** has installed new apparatus for improvement of its water supply system.

Utica Knitting Co., Sherburne, N. Y., is considering new one-story addition to steam power house at local mill, with installation of new equipment.

Proximity Mfg. Co., Greensboro, N. C., has awarded contract for electrical work at White Oak Unit to Bryant Electric Co., High Point, N. C. About $40,000 will be expended.

Pauline Mill community house, Kings Mountain, N. C., is nearing completion. It is a one-story stone building.

Consolidated Textile Corp., Shelbyville, N. C. (Ella unit), has undergone a number of improvements, including new floors in the weave-room and the repainting of the mill inside and out.

Canadian Cottons, Ltd., are having extensive repairs made to the dam used for the generation of power for their St. Croix mill at Milltown, N. B. Plans for the work are being drawn by the firm's engineering staff.

Dominion Textile Co., Ltd., reports progress in the construction of the extension to its steam generating plant in St. Magog, Que. New buildings already constructed include a boiler house, 75x47 ft., designed to accommodate two high-power steam boilers, and a coal shed, 95x30 ft.

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Clock Company Takes Safety Record

Old Hickory, Tenn., plant of the E. I. du Pont De Nemours Co., which has held the world's safety record for an industrial plant, has lost to the Western Clock Co. of Pero, Ill. The record held by the Old Hickory unit of the du Pont Co., was 9,166,634 consecutive man-hours without an accident. The new record of the clock company stands at 9,166,635 man-hours and continues to climb, according to the reports.

QUOTATIONS

At close of business, September 1, 1934

Prices cover average qualities unless otherwise stated

Cotton Goods

	*Sept. 1	*Aug. 1	1933 *Sept. 1
PRINT CLOTHS			
27 -in., 64x60, 7.60	5	4¾	4¾
38½-in., 64x60, 5.35	7⅜	6¾	6½
39 -in., 68x72, 4.75	8¼	7⅜	7⅝
39 -in., 72x76, 4.25	8¾	8⅛	8⅜
39 -in., 80x80, 4.00	9¼	9	8⅞
BROWN SHEETINGS			
36-in., 56x60, 4.00	7¼	7¼	7⅛
36-in., 48x48, 5.00	6¼	6⅛	6⅜
37-in., 48x48, 4.00	7¼	7⅛	7⅛
MISCELLANEOUS			
Drills, 37-in., 3 yd	10	9⅜	11½
Denims, 2.20	15½	15⅜	17
Tickings, 8 oz.	19	18½	20
Standard prints	7½	7¼	7¾

*Tax included.

Cotton Waste

Peeler comber	13.75
Peeler strip	13.25
White spooler (single)	7.00
Linters (Mill Run Average)	6.00

Cotton Prices

Spot Cotton at:	Sept. 4	Aug. 1	For Month High	Low	1933 Sept. 1
New York	13.15	13.20	13.95	13.10	9.45
New Orleans	13.13	13.08	13.80	12.93	9.20
Liverpool	7.08	7.04	7.42	7.03	5.60

FLUCTUATIONS OF FUTURES

	Closed Sept. 4	For Month High	Low	Closed Aug. 1	Net Change
Sept	12.92	13.74	12.90	13.05	—.13
Oct	12.99	13.82	12.97	13.12	—.13
Nov	13.05	13.89	13.02	13.18	—.13
Dec	13.11	13.96	13.07	13.24	—.13
Jan	13.17	14.01	13.13	13.28	—.11
March	13.20	14.12	13.24	13.29	—.09
May	13.24	14.18	13.31	13.47	—.23
July	13.30	14.21	13.36	13.52	—.32

AVERAGE PRICE JUNE-JULY SHIPMENT HARD WESTERN COTTON

	F.o.b. New England Middling	St. Middling
1⅛-in.	16.17	17.17
1 3/16-in.	17.17	18.67
1¼-in.	18.67	21.17

Based on October, 13.17.

FOREIGN COTTONS

Alexandria Exchange, Aug. 30	
November, Sak	16.05
October Uppers	13.15
Nov.-Dec. Shipment c.i.f. Boston (Tariff not included)	
Medium Sak	25.75
Medium Uppers	24.00
(By Anderson, Clayton & Co.)	
India Rough, Calcutta Camilla	10.00
China Tientsin No. 1	12.50

Quotations on cotton cloth and cotton yarn as given on this page include the cotton processing tax. Cotton waste prices also include the processing tax but of course the prices on various raw cottons do not include it.

Cotton Yarn (Nominal)

(Tax Added)

CARDED (Average Quality)

Double Carded 2c—4c., higher according to quality

SINGLE SKEINS OF TUBES (Warp Twist)

4s to 8s	$0.29	20s	$0.32½
10s	.29½	24s	.34½
12s	.30	26s	.35½
16s	.31	30s	.37½

TWO-PLY SKEINS AND TUBES

8s-2	$0.29½	20s-2	$0.33
10s-2	.30	24s-2	.35
14s-2	.31	30s-2	.38
16s-2	.31½	40s-2	.44

SINGLE WARPS

10s	$0.30	20s	$0.33
14s	.31	24s	.35
16s	.31½	30s	.38

TWO-PLY WARPS

8s-2	$0.30	20s-2	$0.33½
10s-2	.30½	24s-2	.35½
14s-2	.31½	30s-2	.38½
16s-2	.32	40s-2 ordin.	.44½

HOSIERY CONES (Frame Spun)

8s	$0.29½	18s	$0.32
10s	.30	20s	.33
12s	.30½	22s	.34
14s	.31	24s	.35
16s	.31½	26s	.36

COMBED PEELER (Average Quality)

TWO-PLY—(Knitting Twist) Cones

20s-2	$0.41	50s-2	$0.55½
30s-2	.46	60s-2	.61½
40s-2	.51	80s-2	.81½

WARPS, SKEINS AND CONES

TWO-PLY—(Warp Twist)

20s-2	$0.41½	50s-2	$0.56½
30s-2	.46½	60s-2	.62½
36s-2	.49½	70s-2	.76½
40s-2	.51½	80s-2	.82½

SINGLES

14s	$0.38	38s	$0.49½
20s	.40½	40s	.50½
28s	.44½	50s	.55½
30s	.45½	60s	.61½

MERCERIZED CONES—(Combed, Ungassed)

30s-2	$0.50	60s-2	$0.73
40s-2	.55	80s-2	1.00

Raw Silk

Prices Nominal

	13/15 White	20/22 White	20/22 Yellow
Special Grand, 85%	$1.35	$1.13	$1.05
Grand XX, 83%	1.19	1.11	1.04
Special Crack, 81%	1.15	1.08	1.01
Crack XX, 78%	1.11	1.05	.99
Extra, Extra, 73%	1.08	1.03	.95
Best Extra, 68%	1.03		

RAW SILK EXCHANGE

	Sept. 4	Aug. 1	For Month High	Low	Net Change
Sept	1.07	1.07½	1.13	1.08	—.00½
Oct	1.09½	1.09½	1.14½	1.09½	
Nov	1.10	1.09½	1.15½	1.09½	+.00½
Dec	1.11	1.11½	1.16	1.11½	—.00½
Jan	1.12	1.11½	1.16	1.11½	+.00½
Feb	1.12	1.11	1.16½	1.11½	+.01
March	1.12	1.11½	1.16½	1.11½	+.00½

Silk Yarns

Hosiery tram 5thd. Japan, 85%	$2.05
Hosiery tram, 5thd. crack XX, 78%	1.80
60/2 spun silk	2.95

RAYON WASTE

Thread (for garnetting)	$0.12–$0.14

Wool

OHIO, PENNSYLVANIA, ETC. (GREASE)

Fine delne	$0.30 –$0.31	⅜ blood	$0.32 –$0.33
Fine clthg	.25 – .26	¼ blood	.31 – .32
½ blood	.30 – .31		

TEXAS AND CALIFORNIA (CLEAN)

Texas, 12 months	$0.71 –$0.73
California, Northern	.61 – .62

MONTANA, IDAHO, WYOMING (CLEAN)

Staple fine	$0.75 –$0.77
Staple ½ bld	.72 – .75
Fine and fine medium (original bag)	.72 – .75
⅜ blood	.66 – .68
¼ blood	.55 – .57

EASTERN SCOURED PULLINGS

A.A	$0.80 –$0.85	B-Super	$0.63 –$0.65
A-Super	.75 – .80	C-Super	.55 – .60

CARPET WOOL (Nominal)

Aleppo (clean)	$0.19 –$0.22
Sining	.12 – .16
China filling (clean)	.11 – .15

Tops and Noils

TOPS—BOSTON

Fine (64-66s)	$0.95 –$1.00
Half-blood (60-62s)	.92 – .95
Aver. ¾ blood (56s)	.80 – .83
¼ blood (50s)	.75 – .78

NEW YORK TOP FUTURES

	Closed Sept. 4	For Month High	Low	Closed Aug. 1
Sept	77.1	82.50	76.60	82.20
Oct	77.6	82.70	77.10	82.40
Nov	78.1	82.90	77.40	82.60
Dec	78.6	83.10	77.70	82.80
Jan	79.1	83.30	78.20	83.00

TOPS—BRADFORD ENG. (Sept. 1)

Fine (64s)	28½d	⅜ bld. (56s)	21d
½ bld. (60s)	26¼d	¼ bld. (50s)	15d

NOILS—BOSTON

Fine	$0.51 –$0.53	⅜ bld	$0.44 –$0.46
Half bld	.48 – .50	¼ bld	.40 – .43

Worsted Yarns

ENGLISH SYSTEM WEAVING

2-20s 44s	$1.00 –$1.05	2-36s 58s	$1.35 –$1.40
2-30s 46s	1.10 – 1.15	2-40s 60s	1.40 – 1.45
2-30s mixes	1.45 – 1.50	2-50s 64s	1.55 – 1.60

ENGLISH SYSTEM KNITTING

2-20s 44s	$0.95 –$1.00	2-20s 60s	$1.20 –$1.25
2-20s-50s	1.00 – 1.05	2-20s 64s	1.25 – 1.30

FRENCH SYSTEM

1-26s 64s	$1.25 –$1.30	2-40s 64s Zephyrs	$1.45 –$1.50
1-30s 64s warp	1.45 – 1.50	2-50s 66s	1.65 – 1.70

Domestic Rayon (Skeins)

VISCOSE PROCESS

Denier	Filament	Price	Denier	Filament	Price
50	14	$1.15	150	24–40	$0.55
75	30	.90	150	60	.60
100	40	.75	300	44	.45
125	36	.62			

NITRO-CELLULOSE PROCESS

Denier	First Qual.	Denier	First Qual.
75	$0.95 –$1.00	150	$0.60
100	.80 – .85	175	.60

ACETATE PROCESS

Denier	Price	Denier	Price
45	$1.20	100	$0.85 –$0.90
55–65	1.15	120	.70 – .80
75	1.00	150	.65 – .75

CUPRAMMONIUM PROCESS (TWISTED)

Denier	Filament	Price	Denier	Filament	Price
30	24	$1.50	100	75	$0.80–$0.90
75	60	.95–$1.05	150	112	.65– .75